Investigación en sistemas de salud

Contribuciones selectas del INSP en el XV aniversario del CISS

Instituto Nacional de Salud Pública

15 años CISS

CENTRO DE INVESTIGACIÓN EN SISTEMAS DE SALUD

Investigación en sistemas de salud

Contribuciones selectas del INSP
en el XV aniversario del CISS

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Presentación

El Centro de Investigación en Sistemas de Salud (CISS) se fundó el 18 de septiembre de1995 con la aprobación de su estructura por la Trigésimo Quinta Junta de Gobierno del INSP a solicitud de su director general, el Dr. Jaime Sepúlveda Amor. Cumple así quince años de contribuir a las políticas y los programas tendientes al fortalecimiento del sistema de salud. Al momento de su creación, se integraron al CISS profesores-investigadores en administración, ciencias sociales y estadística de la Escuela de Salud Pública de México (ESPM), cuya estructura administrativa pasó a ocupar. Se sumaron al CISS también profesores-investigadores en sistemas de salud del Centro de Investigación en Salud Pública al transformarse éste en el Centro de Investigación en Salud Poblacional.

La planta del CISS se integra hoy con 46 profesores-investigadores de tiempo completo de los cuales 28 cuentan con doctorado, con más de 24 investigadores por proyecto y más de 57 asistentes y personal administrativo. La misión del CISS es fortalecer los sistemas de salud aportando evidencia y formando capital humano para el desarrollo institucional y social. Su visión es ser líder en innovación y desarrollo para la integración de los sistemas de salud. Para alcanzar esta misión, el CISS persigue el objetivo de generar conocimiento y capital humano que promueva la equidad, la calidad y la eficiencia en los sistemas de salud.

Este volumen conmemora el XV Aniversario del CISS con una selección de artículos de investigación publicados previamente en su campo a partir de la fundación del CISP en 1984. El volumen tiene el propósito de demostrar la rica contribución del CISS al fortalecimiento de los sistemas de salud y reconocer el legado del CISP y de la ESPM, así como la notable contribución de otros centros del INSP y de investigadores de otras instituciones que colaboran con el INSP a la investigación en sistemas de salud. Con este reconocimiento esperamos promover una más amplia colaboración entre centros e instituciones afines para fortalecer la investigación en sistemas de salud de excelencia y pertinencia.

Los artículos aquí reunidos fueron seleccionados por un comité de investigadores para presentar la amplia gama de temas de investigación que caracterizan la producción institucional y que demuestran también la rica colaboración del INSP en el ámbito internacional. Algunos de ellos abordan como objeto principal de estudio las funciones del sistema de salud, mientras que otros se centran primordialmente en la respuesta social organizada a problemas específicos de salud. En todos los casos se procuró una contribución actual y pertinente a los grandes retos del sistema nacional de salud, a fin de acercar la literatura a una audiencia amplia y diversa para su análisis y su aprovechamiento.

Evolución de la investigación en sistemas de salud en el INSP

Miguel A. González Block

(1) Director del Centro de Investigación en Sistemas de Salud del INSP.

Introducción

La segmentación del sistema de salud en México ±y en la mayoría de los países de América Latina± significa la asignación de recursos públicos de manera inequitativa con base en la segmentación del mercado laboral en trabajadores formales de los sectores público y privado y una masa de trabajadores del sector informal. La segmentación obedeció a la organización corporativista del Estado mexicano posrevolucionario y fue un factor económico y político para el acelerado desarrollo económico bajo el modelo de sustitución de importaciones.[1] Este modelo se ha difundido en múltiples áreas de la política social, y ha llevado a importantes inequidades que se reflejan en la salud.[2]

México es hoy un país democrático que clama por igualdad de oportunidades y mayor libertad. El país está también plenamente inserto en la economía global y requiere un sistema de salud que impulse la competitividad y prevenga de los riesgos que dicha inserción implica. Ocupar el primer lugar mundial en el rubro de obesidad infantil, tener una de las tasas más altas de diabetes, o bien estar expuestos a los embates de las pandemias de enfermedades infecciosas, confirma esta situación. El mercado laboral es, por su parte, crecientemente inestable y la frontera entre los trabajadores formales, los informales y los desempleados se hace cada vez más porosa, con importantes repercusiones para la eficiencia y la calidad del sistema de salud.[3] Los patrones de utilización de los servicios atestiguan que la población no respeta la segmentación y procura la atención médica privada o en instituciones para las cuales no goza de derechos de afiliación o cuya misión es atender a otros grupos de la población.[4]

La segmentación entre trabajadores con acceso y sin éste a la protección financiera en salud se ha visto drásticamente reducida gracias al importante incremento al financiamiento de la Secretaría de Salud mediante el Sistema de Protección Social en Salud.[5] Con ello, las diferencias en el gasto per cápita entre un afiliado a la seguridad social y otro que lo está al Seguro Popular son mucho menores y apuntan hacia la posibilidad de igualar el acceso efectivo a los servicios de salud en ambas poblaciones. No obstante, preservar la segmentación en el acceso a los servicios médicos y de salud preventiva financiados con recursos públicos no sólo no es ético, sino que tampoco es ya una estrategia racional para responder a los retos de la salud y para aprovechar la enorme capacidad que significan los servicios de salud para contribuir al desarrollo. El sistema nacional de salud requiere una profunda reforma que permita actualizar la capacidad del Estado para fondear la salud de manera eficiente y equitativa, así como para destrabar el impulso social hacia la prestación de servicios de calidad para el control de enfermedades, la promoción

de la salud y la atención médica en el marco de la globalización y la democracia.

La investigación en sistemas de salud puede jugar un papel esencial en el manejo de la información dentro del complejo proceso de la reforma sectorial y en el diseño y la implementación de programas integrados de salud.[6] Este volumen presenta 43 de los 467 artículos en la materia publicados por investigadores del Instituto Nacional de Salud Pública (INSP) y de las instituciones que lo antecedieron desde la creación del Centro de Investigaciones en Salud Pública en 1984 hasta mayo de 2011. En este artículo introductorio se presenta la evolución de la investigación y el análisis en sistemas de salud en México y se describen los orígenes del CISS. Se analiza enseguida la producción científica en que se enmarcan las obras seleccionadas. El artículo concluye con reflexiones sobre el potencial de la investigación y la colaboración entre centros e instituciones para incidir de manera más decisiva en el proceso de fortalecimiento e integración del sistema nacional de salud.

Evolución de la investigación en sistemas de salud en México

El modelo segmentado de atención a la salud hizo crisis en los años setenta, cuando el crecimiento económico basado en el modelo de sustitución de importaciones se agotó y, en consecuencia, el crecimiento de la población afiliada a la seguridad social se estancó. La crisis económica llevó a la protesta social, pero también a la investigación en sistemas de salud tendiente a identificar los problemas de atención y las opciones de reforma. Cabe reflexionar sobre por qué surge hasta entonces esta línea de investigación, cuando en otras partes del mundo venía desarrollándose al menos desde principios de siglo.[7] La ESPM fue fundada en 1922 con un genuino interés del gobierno en hacer de la salud pública moderna y científica la punta de lanza para el desarrollo urbano y agroindustrial. Sin embargo, la ESPM se limitó a la capacitación y a importar investigación y tendencias de Estados Unidos. Este proceso fue apoyado por el programa de becas de la Fundación Rockefeller, que entre 1920 y 1950 produjo 67 maestros y un doctor en Salud Pública, en su mayoría en la Universidad Johns Hopkins. Los becarios fueron motivados por la confianza que les infundió la Fundación en la Era del Progreso, vinculada a la capacidad de la ciencia para resolver sistemáticamente los problemas de la sociedad.[8] No obstante, su incidencia en la investigación en salud pública ±y en sistemas de salud en particular± fue escasa.

Con la rápida industrialización de la posguerra, el Estado fomentó la investigación clínica en el Hospital Infantil y en el Instituto Nacional de Nutrición, enfocada a problemas asociados con la pobreza. Las bases institucionales de la formación en Salud Pública se transformaron también en este contexto. El programa de becas de la Fundación Rockefeller se redujo drásticamente en América Latina, lo que abrió la oportunidad para que la ESPM se hiciera cargo de la formación de posgrado en Salud Pública para la región, con el apoyo de becas de la Organización Panamericana de la Salud. La formación en Salud Pública se apartó así del ambiente universitario que la caracterizaba en Estados Unidos. Cabe precisar que la ESPM no introdujo líneas de investigación y mantuvo el enfoque pragmático que la caracterizaba, a pesar de los crecientes problemas de coordinación de los programas verticales y los servicios de atención primaria de la Secretaría de Salubridad y Asistencia y el Instituto Mexicano del Seguro Social. En este contexto floreció la revista *Salud Pública de México*, fundada en 1959, la cual puso énfasis en la documentación de los problemas de salud y el desarrollo de los programas.

A mediados de la década de los setenta, la Universidad Autónoma Metropolitana creó la Maestría en Medicina Social bajo la influencia de pensadores críticos que buscaban modificar los determinantes sociales de la salud y extender modelos de atención médica universal. En 1977, la ESPM estableció su primer programa de investigación en el área de sistemas de salud por medio del programa de Antropología Médica, en colaboración con el Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS). Los primeros empeños sistemáticos por analizar la encrucijada de instituciones de salud se produjeron en 1981, en la Coordinación de Sistemas de Salud, órgano creado por el presidente José López Portillo al final de su mandato, con la coordinación del doctor Guillermo Soberón.[9] Soberón acababa de terminar exitosamente su rectoría de la Universidad Nacional Autónoma de México, donde impulsó el crecimiento de los institutos de investigación. La Coordinación no sólo produjo el primer diagnóstico institucional extenso, sino que propuso la creación del Sistema Nacional de Salud e identificó la necesidad de fortalecer la investigación en sistemas de salud.

Al ser nombrado Secretario de Salud en 1982, el doctor Guillermo Soberón se abocó a establecer el Sistema Nacional de Salud sobre tres pilares: el derecho a la salud como norma constitucional, con la Secretaría de Salud a la cabeza del sector; la descentralización de los servicios

en el ámbito estatal y su integración; y el fortalecimiento de la formación y la investigación en salud pública con la creación del Centro de Investigaciones en Salud Pública (CISP) y del Centro de Investigaciones en Enfermedades Infecciosas, que vendrían a consolidarse, junto con la ESPM, en el Instituto Nacional de Salud Pública en 1987. El contexto adverso en que estos centros se fundaron ±la profunda recesión económica de 1982 a 1985, en que se redujo 25.5% el gasto en salud del sector público y 30% los salarios reales±[10] confirma la convicción respecto del papel que el posgrado y la investigación podían desempeñar.

Orígenes y situación actual del CISS

La investigación en sistemas de salud fue particularmente señalada por el secretario Soberón para proporcionar la evidencia necesaria que consolidara el sector salud, garantizara el acceso universal a la atención e integrara la gestión de programas de control, todo ello en un contexto de reducción de la financiación del sector salud. Así, nombró a Julio Frenk como director del CISP y confirió 15 preciadas plazas federales para su arranque,[11] para las que Frenk atrajo a jóvenes talentos que, como él, habían roto la prolongada tradición de pragmatismo y estaban en ese momento graduándose como doctores en diversas disciplinas afines a la salud pública en México y en el extranjero. Pieza clave en la consolidación del CISP fue su Comité Asesor Internacional, que reunió anualmente el expertise de talentos en investigación en sistemas de salud de la talla de Brian Abel-Smith, Avedis Donabedian, Harvey Fineberg, Rodrigo Guerrero y Robin Badgley. El CISP propuso un ambicioso programa centrado en temas fundamentales como, por ejemplo, la transición epidemiológica, la calidad de la atención, la eficacia de las intervenciones de atención primaria y los determinantes de la oferta de médicos y el empleo.[12]

El CISP debía rendir frutos inmediatos que respondieran a las expectativas y justificaran la inversión. Destaca al respecto el primer programa docente en sistemas de salud, constituido en colaboración por el CISP y la ESPM: el Programa Avanzado de Dirección y Organización de Sistemas de Salud (PROASA), dirigido por el doctor Enrique Ruelas y financiado por la Fundación Kellogg. El CISP también mostró su valor escasamente un año después de su fundación, al responder con un estudio multidisciplinario a los devastadores terremotos de septiembre de 1985, que dieron lugar a una pérdida severa de la infraestructura de salud, incluidas 5 000 camas hospitalarias. Sus recomendaciones apoyaron la reconstrucción descentralizada de la infraestructura y la implantación de los innovadores Centros Avanzados de Atención Primaria.

El CISP estableció entonces dos principios que a la fecha siguen vigentes: la relevancia de sus productos para la toma de decisiones y la excelencia en la calidad académica.[13] Sobre la base de estos principios, encaró el reto de demostrar a los decisores el valor de la investigación y de la formación del posgrado, y a los investigadores biomédicos, la capacidad de producir investigación a la altura de los estándares más rigurosos. Desde entonces se han establecido mecanismos y herramientas para reducir la brecha entre los investigadores y los responsables políticos, tales como seminarios conjuntos, ejercicios para establecer prioridades, resúmenes ejecutivos y una puerta giratoria entre las dos comunidades.

La evolución de la investigación en sistemas de salud en el CISP y en el INSP se apoyó decididamente en la Fundación Mexicana para la Salud (Funsalud), institución también auspiciada, en 1985, por el doctor Soberón para fungir como pilar de colaboración con el sector privado de la salud. Así, la primera beca de Funsalud se otorgó a un investigador del CISP para que realizara una gira por escuelas de Salud Pública de Estados Unidos y estableciera vínculos de colaboración en materia de sistemas de salud. Funsalud promovió alianzas estratégicas para el diálogo político y el desarrollo con instituciones académicas, el sector privado, gobiernos, organizaciones internacionales, la sociedad civil y otras fundaciones en el extranjero. Funsalud apoyó, asimismo, la repatriación de cerebros, lo que se tradujo en importantes contribuciones para el INSP.

Funsalud y el INSP desarrollaron conjuntamente diversas iniciativas, entre las que destaca el Núcleo de Acopio, Análisis y Difusión de Iniciativas de Reforma. Uno de los principales aportes de Funsalud, el estudio de Economía y Salud, se sirvió de la colaboración de investigadores del INSP en temas tales como las cuentas nacionales de salud y el peso de la enfermedad, apoyando así ±por primera vez en el mundo± la "tropicalización" de importantes herramientas impulsadas por el Banco Mundial y la Organización Mundial de la Salud (OMS) para el análisis sectorial. Estos trabajos serían clave para el establecimiento del Foro Mundial sobre Investigaciones Sanitarias en Ginebra, en 1999 y de la Alianza de Investigación en Políticas y Sistemas de Salud en la OMS, en 2000. En México, estos trabajos nutrirían de manera importante la descentralización del sector salud en los años noventa y el Sistema de Protección Social en Salud en 2004.

El impulso a la investigación en sistemas de salud en el INSP se vio reflejado en la creación del Centro de In-

vestigación en Sistemas de Salud (CISS), propuesto por el entonces director del Instituto, doctor Jaime Sepúlveda, y aprobado por la Junta de Gobierno el 18 de septiembre de 1995. El CISS consolidó la masa crítica de investigación en el tema con un claro enfoque en el fortalecimiento del Sistema Nacional de Salud. Atrajo, así, a buena parte de los profesores de la ESPM, cuya integración a los centros de investigación del INSP hizo posible el afianzamiento del CISS. Integró, además, la Unidad de Economía de la Salud ±que ya operaba independientemente± y la enseñanza de sistemas de salud y ciencias sociales, lo que permitió establecer la Maestría en Ciencias en Sistemas de Salud y el Doctorado en Ciencias en Sistemas de Salud. En sus quince años de historia el CISS ha formado a más de 700 especialistas, maestros y doctores en diez programas académicos, de los cuales seis están vigentes.

Contribución del INSP y del CISS a la investigación

Considerando la fundación del Centro de Investigaciones en Salud Pública en 1984 como un parteaguas en las actividades de su campo, cabe reseñar las tendencias de investigación en sistemas de salud a las que dio lugar en la ESPM y en los centros de investigación una vez fundado el INSP en 1987.* En este periodo se publicaron 467 artículos en el campo en revistas científicas indexadas, correspondientes a 29% del total de las publicaciones de las mismas instituciones. Durante el periodo publicaron 1 058 autores y se registraron un total de 2 037 autorías. Investigadores del INSP fueron primeros autores de 75% de los artículos y dentro de éstos, autores del CISS lo fueron para el 42% y autores de otros centros para el 58% restante.

La evolución de publicaciones en sistemas de salud tiene un primer impulso al inicio del periodo y hasta aproximadamente 1993, cuando se observa un menor crecimiento hasta 2005, año a partir del cual se dio un marcado crecimiento que persiste hasta nuestros días (figura 1). Tanto el CISS como el Centro de Investigaciones en Salud Poblacional (CISPob, para diferenciarlo del CISP) son responsables del auge en el tercer periodo, si bien el CISS mantiene un mayor número de publicaciones, con excepción de 2010, cuando CISPob publicó más, sobre todo por el tema de tabaco (figura 2).* Un autor del CISS aparece como responsable o representante institucional de 48% del total de las publicaciones en el periodo (figura 3).

La provisión de servicios es la función del sistema de salud que ha sido más abordada, con 35% del total de los artículos. Le siguen gobernanza (18%), financiamiento (16%) y determinantes sociales (14%) (figura 4). En comparación con otros centros, el CISS observa una proporción más similar entre funciones abordadas. El CINyS, y en menor medida el CISPob, se enfocan más en la función de provisión de servicios, mientras que el Centro de Investigación en Evaluación y Encuestas (CIEE) lo hace en la función de financiamiento (figura 5).

Dentro de la gama de problemas de salud abordados en el periodo, los de mayor frecuencia son salud reproductiva y VIH-SIDA (16% cada uno, de los artículos con un problema de salud definido) y tabaco (13%) (figura 6). Las enfermedades transmitidas por vector son las menos abordadas (4%). El CISS tiene el mayor balance a través de los problemas de salud tratados (figura 7), si bien destaca su poca participación como primeros autores en problemas de salud que son centrales o predominantes en otros centros: nutrición en el caso del CINyS o CaCu y tabaco en el caso del CISPob. No obstante, VIH-SIDA es una prioridad para el CISS y es el tema predominante en el caso del CIEE.

Los grupos sociales más abordados en los artículos con una clara identificación de poblaciones son la población general (21%), seguida de beneficiarios, usuarios y enfermos (18%), personal de salud (16%) y mujeres en general (15%) (figura 8). Junto con mujeres en edad reproductiva (7%), las mujeres fueron objeto de 22% de dichos artículos. EL CISS es el centro que más balance muestra en las diversas poblaciones estudiadas (figura 9). El Centro de Investigación en Nutrición y Salud (CINyS) se enfoca

* Se define la investigación en sistemas de salud como la generación de conocimiento sobre la respuesta social organizada a los problemas de salud. Se incluyeron artículos y reseñas con resumen, con palabras clave en sistemas de salud y con afiliación institucional en los índices Scopus, Medline e ISI desde 1984 hasta mayo de 2011. Se validaron los resultados con los investigadores para identificar publicaciones adicionales y se analizó en todos los casos su contenido a nivel del resumen. Los artículos fueron clasificados por centro de investigación según la afiliación del primer autor o del autor del INSP más próximo al primero en artículos con primera autoría de otra institución. Los artículos de los directores generales del INSP fueron asignados al centro de investigación al que pertenecían con anterioridad a su nombramiento (Frenk, Hernández, Rodríguez) o al CISPob (Sepúlveda).

* La información se analiza por centro considerando la afiliación del primer autor del CISP, ESPM o centros INSP o bien al autor institucional en primera mención para artículos dirigidos por autores externos.

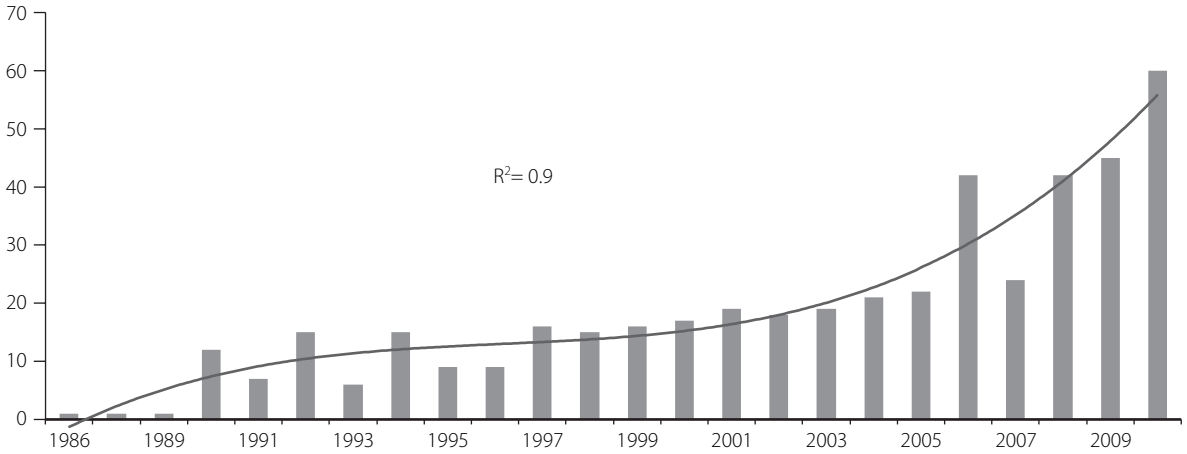

Figura 1. Publicaciones en sistemas de salud. CISP, ESPM e INSP. 1984-2010. N=452

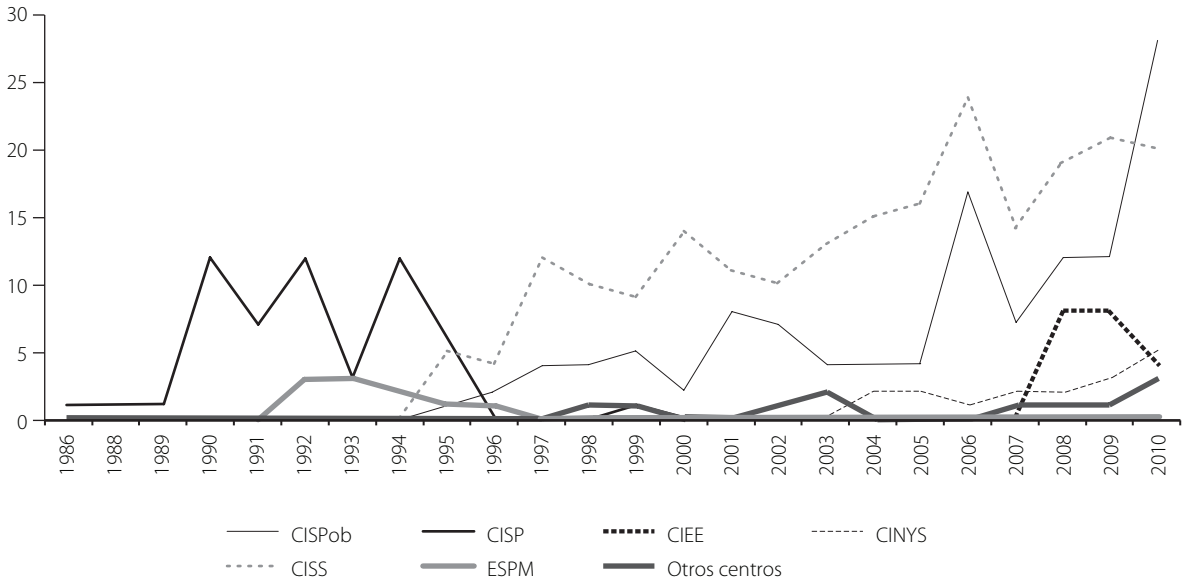

Figura 2. Publicaciones según institución/centro: ESPM, CISP, ESPM y Centros INSP. 1984-2010. N=452

mucho más en menores de 5 años mientras que el CISPob tiende a privilegiar a los beneficiarios, usuarios y enfermos, así como a las mujeres en general. Analizando ahora los principales métodos reportados en los artículos, vemos que el CISS utiliza más que otros centros la econometría así como encuestas a proveedores, encuestas nacionales de salud, entrevistas en profundidad, etnografía y otros métodos. El CISPob utiliza más encuestas a grupos específicos de población y revisión de expedientes (figura 10).

Nuevas direcciones del CISS y de la investigación en sistemas de salud

El innegable trabajo y los logros patentes del INSP en la investigación y en la formación del posgrado en sistemas de salud contrastan con un relativo menor impulso por parte de otras instituciones del ámbito nacional. El CISS está apoyando al Centro Regional de Investigación en Salud Pública en Tapachula, Chiapas, para crear fortalezas

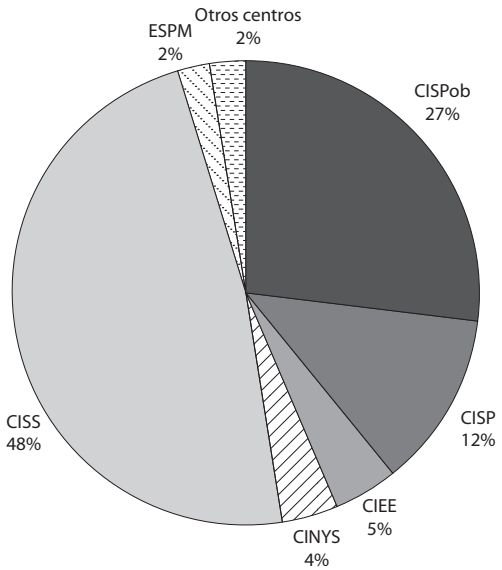

Figura 3. Publicaciones por institución/centro del primer autor. CISP, ESPM y Centros INSP. 1984-mayo de 2011. N=467

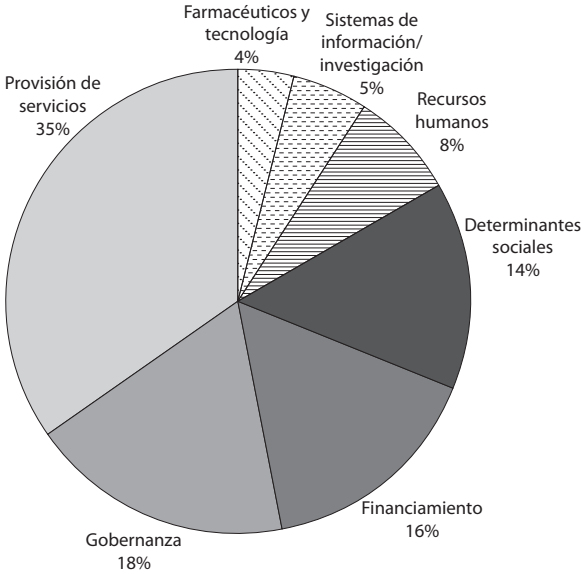

Figura 4. Funciones del sistema de salud abordadas por los artículos de investigación de sistemas de salud. CISP, ESPM e INSP. 1984-mayo de 2011. N=450

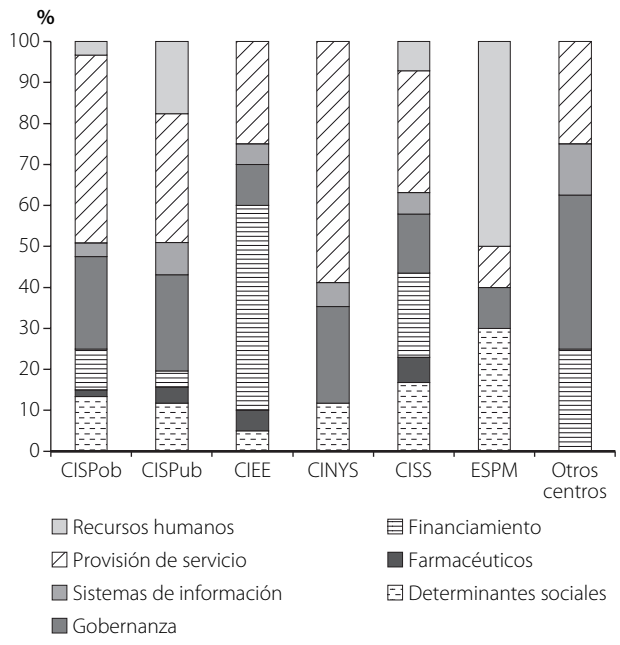

Figura 5. Funciones del sistema de salud abordadas por los artículos de investigación de sistemas de salud según CISP, ESPM y centros INSP. 1984-mayo de 2011. N=450

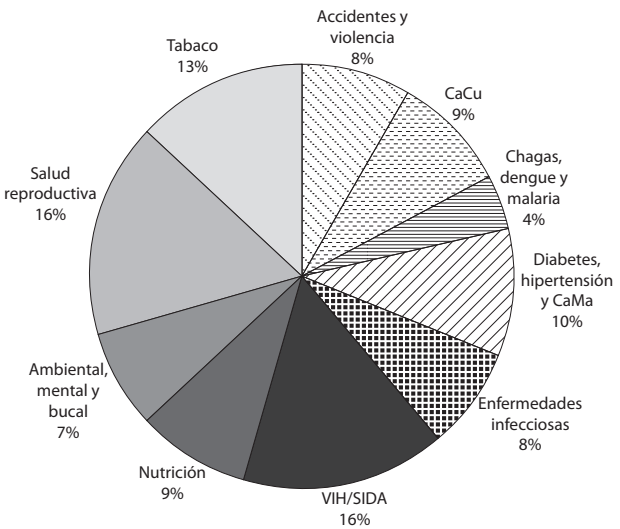

Figura 6. Problemas de salud abordados por los artículos de investigación de sistemas de salud. CISP, ESPM e INSP. 1984-mayo de 2011. N=270

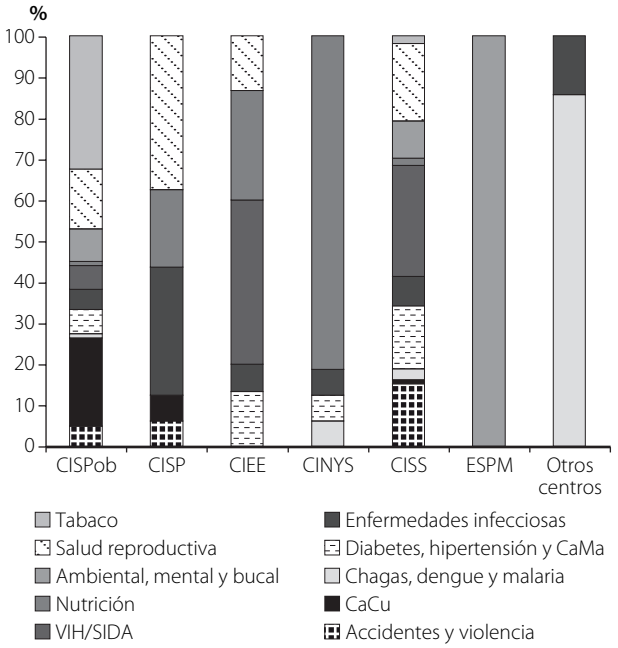

Figura 7. Problemas de salud abordados por los artículos de investigación de sistemas de salud según CISP, ESPM y centros INSP. 1984-mayo de 2011. N=270

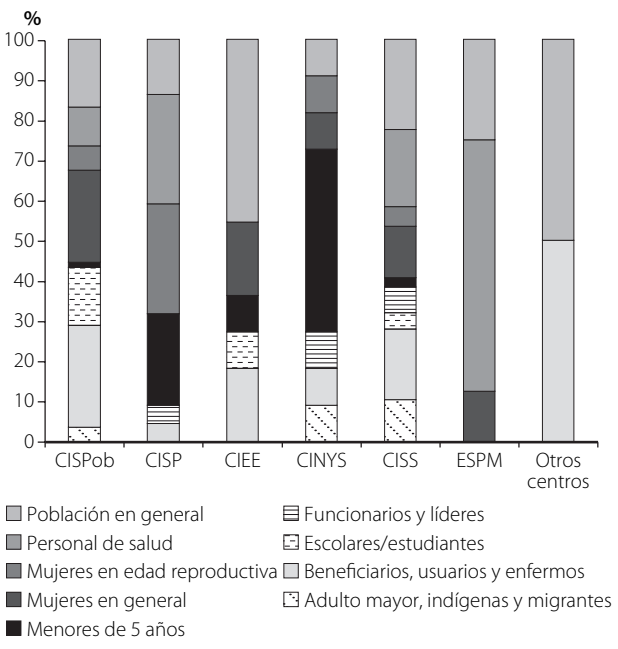

Figura 9. Poblaciones abordadas por los artículos de investigación de sistemas de salud según CISP, ESPM y centros INSP. 1984-mayo de 2011. N=264

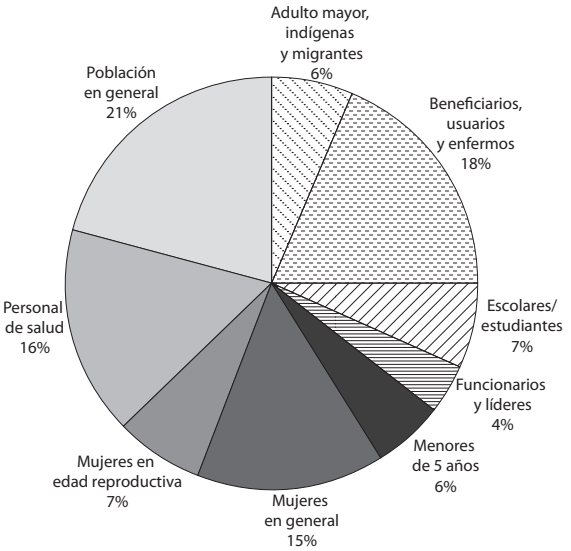

Figura 8. Poblaciones abordadas por los artículos de investigación de sistemas de salud. CISP, ESPM e INSP. 1984-mayo de 2011. N=264

en la investigación en sistemas de salud y está impulsando la estrategia de los Centros Estatales para el Desarrollo de Sistemas de Salud (CEDESS). Dicha estrategia se aplica en el Estado de México, en Oaxaca y en Veracruz, para impulsar la capacitación, la investigación y el apoyo técnico en diversas áreas. El CISS estableció, asimismo, una Coordinación de Gestión del Conocimiento e imparte un curso de verano en Políticas y Programas sobre Bases Científicas, para fortalecer la demanda de resultados de investigación.

El CISS está dando impulso también al Programa de Salud Global, iniciativa institucional coordinada desde el Centro, que apoya la investigación y la enseñanza en torno a los retos implicados en la transferencia internacional de riesgos a la salud, así como a la disponibilidad de evidencia sobre la efectividad de las políticas y los programas de salud. En este tenor, el CISS apoya al Instituto Mesoamericano de Salud Pública, iniciativa de nueve instituciones centroamericanas y mexicanas, así como de organismos internacionales, con vistas a propiciar la salud global con una colaboración horizontal entre los países y en el marco del Proyecto Mesoamericano de Integración y Desarrollo.

Las tendencias de las publicaciones sobre sistemas de salud que emite el INSP subrayan la necesidad de explotar el potencial de colaboración entre diversos centros de investigación y con otras instituciones. Sus enfoques de investigación pueden apuntalar una mayor colaboración de

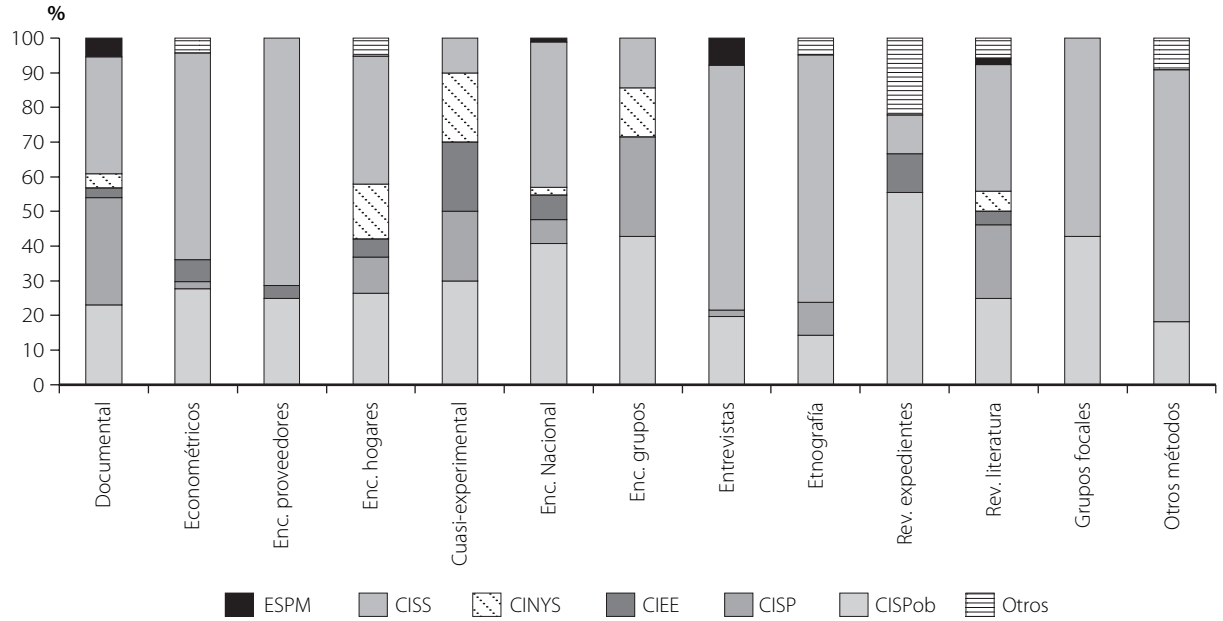

Figura 10. Métodos empleados por los artículos de investigación de sistemas de salud según CISP, ESPM y centros INSP. 1984-mayo de 2011. N=432

los investigadores del CISS en el análisis de la respuesta del sistema de salud a problemas específicos de salud. Hay también un amplio potencial de colaboración entre las distintas áreas de las ciencias sociales y los sistemas de salud en torno a los determinantes de la respuesta social organizada.

Agradecimientos

Se agradece el apoyo de Javier Idrovo del CISS y Maricela Piña del CENDISP para el procesamiento de los datos sobre la producción bibliográfica en sistemas de salud.

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Del "cuánto" al "por qué": la utilización de los servicios de salud desde la perspectiva de los usuarios*

Salud Publica Mex 1997;39:442-450

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El conocimiento de las modalidades bajo las cuales los individuos utilizan los servicios de salud, tanto para prevenir como para resolver un problema de salud, constituye una pieza clave para el diseño de políticas y estrategias tendientes a mejorar la entrega de servicios a la población. Al definir los mecanismos que favorecen el uso oportuno y adecuado de los servicios, es muy importante saber en qué circunstancias se acude al médico, por qué se selecciona determinado servicio y qué factores influyen en estos patrones.

Los estudios convencionales sobre utilización de servicios de salud, como las encuestas de salud, hacen énfasis en la medición y caracterización de los patrones de utilización, de tal manera que se pueden identificar la magnitud del problema y los principales factores asociados a esas prácticas. Sin embargo, por las características propias de la técnica de encuesta, es difícil explorar otros aspectos que permitirían entender cómo y por qué operan esos factores y, por lo tanto, cómo se podría incidir en los mismos. De hecho, la literatura científica contemporánea ha comenzado a dar cuenta de la importancia de los abordajes cualitativos y les ha abierto espacios.[1-3]

En el estudio cualitativo que se analiza aquí se busca identificar los principales obstáculos que los individuos y las familias enfrentan para la utilización de servicios médicos. En ese sentido, el interés radica en identificar los factores que, desde el punto de vista de algunos de los actores involucrados (médicos y pacientes), influyen sobre la decisión de utilizar los servicios. Esta investigación se llevó a cabo en forma paralela a la Encuesta Nacional de Salud II (ENSAII). El estudio cualitativo y la ENSA-II constituyen dos estrategias metodológicamente independientes que se complementan; la última permite generalizar sobre la relación entre variables, mientras que el primero permite profundizar en los significados que median en los procesos de utilización, así como en la identificación de obstáculos concretos que puedan ser superados mediante políticas de intervención.

Los primeros resultados de la ENSA-II se incluyeron en un documento publicado en 1994,[4] donde quedaron claramente expresados los objetivos de la encuesta; la mayoría de los capítulos está dedicada a dimensionar cuantitativamente diversos aspectos del problema de la utilización de los servicios de salud. La información de ese documento complementa la que aquí se presenta y, en ciertos casos, señala magnitudes en algunas etapas de los procesos descritos. En la actualidad se están realizando varios trabajos con análisis más específicos, que se publi-

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carán a la brevedad; mientras tanto, el lector interesado podrá recurrir al documento publicado en 1994.

Un paso ulterior y necesario será la preparación y publicación de trabajos donde los estudios cuantitativo y cualitativo de la ENSA-II se utilicen en forma integrada y complementaria.

Aspectos conceptuales sobre la utilización de servicios de salud

En la sociología médica el tema de la utilización de servicios, ¿por qué se usan? o ¿por qué no se usan?, y ¿por qué se usan de una manera determinada?, ha sido largamente debatido; de hecho, existen diversos estudios y varias revisiones amplias de esta literatura. A partir del concepto parsoniano del papel del enfermo (sick role),[5] Mechanic[6] formuló, para complementarlo, el concepto de la conducta del enfermo (*illness behavior*), definido como la forma en que los síntomas pueden ser diferencialmente percibidos y pueden llevar a diferentes reacciones en los individuos. Mechanic propuso que el concepto de la conducta del enfermo debía distinguir, por lo menos, cuatro grupos de variables: a) visibilidad y frecuencia de los síntomas; b) grado de severidad de los síntomas; c) existencia de sistemas alternativos para interpretar los síntomas; y, d) factores no sociológicos, tales como las características de los servicios de salud. En esa misma dirección, Suchman[7] propuso que en la conducta del enfermo puede distinguirse la siguiente secuencia: a) percepción de los síntomas; b) adopción del papel del enfermo con validación provisional de individuos no profesionales; c) establecimiento de contacto con los servicios de atención médica; d) ingreso en la relación médico-paciente; y, e) recuperación y rehabilitación.

Rosenstock[8] propuso que la utilización de servicios podía explicarse distinguiendo tres tipos de variables: a) el nivel de disposición del individuo para utilizar los servicios (compuesto, a su vez, por la percepción del individuo sobre la gravedad de la enfermedad y sobre su propia susceptibilidad); b) los beneficios y barreras percibidas (en cuanto a decidirse a utilizar los servicios); y, c) los detonantes de la acción (internos: percepción del estado corporal, o externos: interacción con otros). Anderson,[9] por su parte, también sugirió que la utilización de servicios es el resultado de tres variables, pero agrupadas de la siguiente manera: a) la necesidad de atención médica (desde el punto de vista tanto del paciente como del personal de salud); b) los factores predisponentes, conformados por variables sociodemográficas asociadas a las actitudes y creencias en torno a la salud y la enfermedad, tales como edad, sexo, composición familiar, clase social, ocupación, etcétera; y, c) los factores capacitantes, que se asocian a la condición socioeconómica, ya sea en el ámbito familiar (ingresos, ahorros, seguros médicos), o comunitario (disponibilidad, accesibilidad, etc.).

En realidad, la mayor parte de estos modelos, así como de las revisiones de la literatura sobre utilización,[10] representan más bien un intento de identificar las variables que influyen en la utilización de servicios y no una explicación del efecto de cada una de ellas.[11] Algunos autores han propuesto que más que buscar asociaciones entre la utilización y otras variables sociodemográficas, "debemos adoptar una teoría y un método que tome en cuenta las intenciones de los actores en su propio contexto" .[12] Zola insistió en la necesidad de concentrarse en la percepción que el individuo tiene tanto de sus propios síntomas como de las ventajas y desventajas de utilizar los servicios de salud.[13] La utilización de servicios de salud es, esencialmente, un campo de conducta muy dinámico en el cual la capacidad interpretativa de los individuos juega un papel fundamental.[14] En consecuencia, es preciso cuestionar el carácter parcial de los estudios citados y considerar la utilización de los servicios de salud no sólo como un hecho social (determinado por variables externas a los individuos), sino como un tipo específico de acción social, es decir, como una forma de conducta que se explica a partir de los significados que los individuos construyen a través de la interacción social.[15] Lo anterior lleva a abordar el tema desde una posición teórico-metodológica que privilegie el estudio de la subjetividad de los individuos, y que explique la conducta de la utilización de servicios como un fenómeno susceptible de ser comprendido, mediante interpretación sociológica, a partir del sentido que los actores atribuyen a sus propios actos relacionados con la salud y la utilización de servicios.

Metodología

En la realización de esta investigación, se respetó la división del país en cuatro regiones que hizo la ENSA- II, y se seleccionaron dos ciudades por cada región, de la siguiente manera: Chihuahua y Saltillo, de la región norte; Aguascalientes y Morelia, de la región centro; Mérida y Veracruz, de la región sur, y Chilpancingo y Pachuca, de la región PASSPA.* En cada una de estas ciudades se

* En 1994, los estados del Programa de Apoyo a los Servicios de Salud para la Población Abierta (PASSPA) eran Chiapas, el Distri- to Federal, Guerrero, Hidalgo, Oaxaca y Yucatán.

identificaron dos áreas geoestadísticas básicas (AGEB) de nivel socioeconómico medio y dos de nivel bajo.[16] En cada AGEB se entrevistó a 12 enfermos y/o utilizadores de servicios, un total de 192 entrevistas abiertas de este tipo en el país. Esta información se completó con la recabada mediante la realización de dos grupos focales de enfermos y/o utilizadores de servicios, realizadas en las AGEB de nivel bajo de una ciudad de cada una de las cuatro regiones en que se dividió el país, con un total de ocho grupos focales. Asimismo, en cada región se buscó entrevistar a tres médicos de la Secretaría de Salud (SSA), tres de servicios de seguridad social, y otros tres del sector privado. En total se hicieron 61 entrevistas a prestadores de servicios para cubrir la amplia gama de servicios utilizados por los enfermos y/o usuarios.

Tanto en las entrevistas individuales como en los grupos focales se utilizó una guía temática de indagación; en el caso de los prestadores de servicios, esta guía exploraba su opinión sobre las condiciones de su trabajo, las principales dificultades que enfrentan en el ejercicio diario de su profesión, la calidad del servicio que prestan, así como sus apreciaciones sobre el tipo de población que atienden y las motivaciones de esta última para utilizar o no los servicios de salud. En el caso de la población, la guía buscaba reconstruir la carrera del enfermo y la percepción de la calidad y costo de la atención.

Las entrevistas, con una duración promedio de 60 minutos, se procesaron mediante el programa de cómputo Ethnograph.[17] Para efectos de la codificación y análisis se diseñó un guión para orientar los temas que deberían analizarse para cada región. Sin embargo, se mantuvo la flexibilidad suficiente para favorecer que del material recolectado emergieran las categorías más pertinentes para la codificación. Así, esta estrategia permitió asegurar homogeneidad de análisis en un nivel general, al mismo tiempo que facilitó el surgimiento de aspectos particulares específicos para cada región.

La perspectiva de los usuarios de servicios de salud

En este artículo se presentan sólo algunos de los hallazgos más relevantes de esta investigación, relacionados con las entrevistas a enfermos y/o utilizadores de servicios de salud.

En un artículo posterior se presentan los resultados relacionados con las entrevistas a proveedores de servicios de salud y se da cuenta, con mayor detalle, de la riqueza del material recolectado. El eje de la argumentación de este artículo se apoya en testimonios de los entrevistados, si bien por razones de espacio este ejercicio resulta poco práctico para todos y cada uno de los hallazgos aquí reportados.

El orden para la presentación de los resultados de utilizadores ±reales o potenciales± corresponde a los estadios de la carrera del enfermo.[6] El primer aspecto que se aborda es cómo percibe la población el cuidado de la salud, qué significa estar enfermo y cómo se utilizan los servicios preventivos. El segundo se refiere al proceso de búsqueda de la atención médica y a los factores que inciden en la decisión de acudir a este servicio. Por último, el tercer aspecto se refiere a la selección y utilización de los servicios.

Estar enfermo - caer enfermo

Una primera constante, evidente en la mayoría de los testimonios analizados, se refiere a la baja utilización de los servicios preventivos. Varios informantes manifestaron que usaron los servicios del Instituto Mexicano del Seguro Social o de la SSA en momentos en que personal de campo y promotoras de salud de estas instituciones hacían campañas entre la población (de vacunación, de detección oportuna de cáncer, etc.). Al parecer, la importancia de utilizar los programas preventivos se diluye frente a la necesidad de resolver otro tipo de satisfactores que no necesariamente tienen que ver con la salud. En general, la utilización de los servicios de salud para la prevención se hace de manera pasiva, entendiendo por esto que el servicio es el que busca de manera intencionada a la población blanco:

> Nos revisaron los dientes, y a los que los traían mal les daban un papelito para que fueran al dentista, para que se los revisaran [...]*

La prevención entre los sectores bajos se confunde muy fácilmente con la automedicación:

> Mientras tenía la medicina estaba bien, pero nomás se acababa el efecto y volvía otra vez. Y así me la pasaba con mi penicilina. Fueron hartas inyecciones... yo me autorrecetaba porque ya sabía qué era lo que me hacía más efecto.**

* Entrevista núm. 11, Chihuahua, Chihuahua.
** Entrevista núm. 8, Chihuahua, Chihuahua

Esto tiene mucho que ver con la distinción entre estar enfermo y caer enfermo. Es muy frecuente escuchar que sólo ante la manifestación de una enfermedad se inicia la "prevención", buscando con ello evitar caer enfermo, es decir, no poder levantarse para trabajar o cumplir con las actividades rutinarias. Antes de este momento estos sectores mantienen un rango de tolerancia a su malestar, dentro del cual echan mano de sus propias estrategias preventivas que, generalmente, se desarrollan en el ámbito doméstico, familiar, o de las farmacias. La promoción cada vez mayor de medicamentos que alivian el dolor y las molestias, a través de la televisión principalmente, ha servido para reafirmar en estos sectores la tendencia a equiparar la automedicación con la prevención. Si bien no existe una cultura preventiva, por lo menos no en los términos en que se maneja en el discurso médico, sí puede afirmarse que existe una muy particular noción de prevención de la enfermedad que tiene que ver con evitar la incapacidad total. Sólo cuando se está enfermo se toman medidas preventivas para evitar que la enfermedad evolucione negativamente, es decir, para evitar caer enfermo:

> ± ¿Siempre trata de curarse en casa?
> ± Cuando son casos leves, sí. Porque hay veces que realmente se requiere que lo atiendan a uno más en forma.
> ± ¿Como en qué casos?
> ± Cuando se siente uno ya realmente muy incapacitado para laborar o hacer algo. Esa es la única razón.*

En este sentido, para la prevención de complicaciones o enfermedades cuando aparecen los primeros síntomas, la población presenta un patrón de solución de problemas predominantemente intradomiciliario: evitar que una enfermedad común, del tipo de la gripe o diarrea, se complique y buscar que culmine favorablemente, es un asunto que se resuelve en el ámbito doméstico. Las mujeres, en particular la madre o la esposa, toman un papel activo para decidir qué hacer en función del problema y la gravedad del mismo. Ellas inician el proceso con algunas medidas aprendidas de su propia experiencia o de la de familiares o amigos, y utilizan medicamentos prescritos en eventos similares anteriores. En los sectores medios la prevención se asocia a medidas de higiene principalmente y, aunque el uso de servicios preventivos también es poco frecuente, es más fácil encontrar casos de su utilización sobre todo para aspectos relativos al cuidado de la salud materno-infantil.

Es notable que la carrera del enfermo, en muchos casos, se inicia y termina con el consumo de medicamentos. Estos aparecen al principio de la carrera, como resultado de la automedicación preventiva y, al final, destinado a la prescripción que hace el médico en la consulta.

Búsqueda de la atención

En general, las mujeres son quienes realizan un diagnóstico preliminar a los miembros de su familia, a través del cual determinan el tipo de enfermedad y la gravedad de la misma. En este ejercicio, suelen aceptarse como normales ciertos síntomas que, desde la perspectiva de la medicina moderna, se asocian con enfermedades comunes. Después de este diagnóstico, se hace uso de algún medicamento prescrito con anterioridad, combinado con algún remedio casero. Si no da resultado la automedicación y/o el remedio casero resuelven buscar atención. Si se trata de enfermedades calificadas como graves, que impiden trabajar, recurren directamente a un médico; por el contrario, si se trata de síndromes de filiación cultural,*[18] (susto, caída de mollera, etc.) la opción será la medicina tradicional.

Las causas de búsqueda de atención médica no varían tanto entre los sectores medio y bajo, y tal vez las principales diferencias se ubican en la frecuencia y el momento de la búsqueda condicionadas por la derechohabiencia. Tanto para el sector medio como para el bajo, el momento de la automedicación ocurre al inicio de la enfermedad:

> ± Cuando usted se enferma ¿se cura en casa o siempre acude al Seguro?
> ± No, pues cuando es una gripa o algo así, con pastillas y bebidas...
> ± ¿Qué pastillas toma?
> ± Pastillas para el dolor de cabeza
> ± ¿Como qué?
> ± Creo Prodolina o no sé, porque voy a la tienda y pido una pastilla para el dolor de cabeza y ahí me la dan [...].**

Sin embargo, mientras que para el sector medio la automedicación es una opción para enfermedades comunes

* Entrevista núm. 152, Chilpancingo, Guerrero.

* Término convencionalmente utilizado dentro de la antropología médica para referirse a enfermedades no reconocidas por la medicina moderna y que cuentan con una adscripción cultural específica.

** Entrevista núm. 13 Chihuahua, Chiahuahua.

y de fácil o conocido manejo intradomiciliario ±catarro, gripe± para el sector bajo es una opción determinada por la situación económica y potenciada por una percepción diferente de la gravedad de las enfermedades, así como del médico y la institución.

El segundo aspecto de importancia para acudir con un agente de salud, una vez que se ha percibido la necesidad de la atención, es la derechohabiencia o no a un sistema de seguridad social. Los que están fuera del sistema de seguridad social dependen de las opciones que tengan a su alcance, las cuales están mediadas por la capacidad de pago. En la construcción de estas opciones influyen de manera importante las redes familiares, sociales y comunitarias con las que cuentan los enfermos, cuya expresión adquiere diferentes matices e intensidades entre regiones y aun entre ciudades. La manifestación más clara de este fenómeno se observa en la atención de las enfermedades crónicas, en donde estas redes, además de incrementar la gama de fuentes de curación alternativa, funcionan como financiadoras de su costo y, en muchas ocasiones, facilitan el acceso a un determinado servicio:

> ± [...] pues ahí, dos amigas que vivían en la misma colonia
> ± ¿Ellas fueron las que la invitaron a usted a hacerse la prueba?
> ± Sí, que fuéramos, porque yo les decía, ellas me decían cómo se sentían y yo sentía lo mismo que ellas; en- tonces ya me dijeron que fuera y ya pues ahí ya me hicieron el examen gratis... Llegué ahí, ya me hicieron los análisis, dijeron que sí tenía diabetes [...].*

Otro rasgo que llama la atención, en términos de utilización, entre los enfermos crónicos, es la tendencia a combinar diversos tipos de servicios. Abundan los testimonios que muestran que los enfermos crónicos tienden a utilizar tanto servicios médicos modernos como tradicionales e, incluso, en algunos casos, los de tipo mágico-religioso. La característica central de las enfermedades crónicas ±su permanencia en el tiempo± favorece esta conducta: los enfermos crónicos "disponen de tiempo" suficiente para intentar diversos tratamientos para su enfermedad. En este sentido, mientras que en el sector médico prevalece una lógica excluyente ±sólo un tipo de medicina es eficaz±, en la población puede encontrarse una lógica aditiva, que justifica utilizar diferentes alternativas al mismo tiempo o secuencialmente:

> ± [...] mi esposo me dice: "opérate ese absceso porque te puede perjudicar la pierna"; entonces le digo: "pues sí, pero primero tengo que atacar el azúcar, no puedo ir con el azúcar alta porque yo sé que no, es peligroso".
> ± ¿Y por qué decidió cambiar a un naturista y por qué hasta México?
> ± [mi esposo] me dijo: "mira, yo quiero que vayas a ver a ese médico", y yo ya lo había visto a él, le digo, en la revista La Prensa; ahí viene su dirección y viene el testimonio de personas que ha curado, que ellos tienen tantos años con la diabetes y que se han atendido con este médico y que se han aliviado [...].*

Desde la perspectiva de los individuos, los diversos paradigmas médicos son vividos como un todo integrable, difícilmente diferenciables entre sí. En consecuencia, resulta indistinto utilizar el servicio de un médico moderno, que el de un huesero o un curandero.

Dilemas de la utilización

Al igual que la decisión de buscar atención médica, la selección del servicio depende de la derechohabiencia y de la capacidad de pago. Si se es derechohabiente y se requiere atención médica lo más probable es que se acuda a la institución a la que se está afiliado; si no, entre las opciones se elige aquella que puede pagarse y entre las que se incluye la no utilización:

> ± ¿Por qué va a la Cruz Roja?
> ± Pues ya ve que... uno pobre siempre jala uno con la Cruz Roja... porque es lo principal, porque uno pobre... cualquier cosa... que una cortada, que una herida... que esto, va uno a la Cruz Roja. Porque es un lugar donde no le cobran a uno... lo que uno tenga voluntad lo da ahí, y lo atienden los doctores.**

Una tercera condicionante de la selección del servicio son las características percibidas de las instituciones. Si se es derechohabiente, el utilizar o no el servicio responde a las experiencias positivas o negativas acumuladas en el proceso de interacción con los mismos en eventos mórbidos anteriores o experiencias de familiares o amigos. La población derechohabiente, de ambos sectores sociales, percibe una serie de trabas para recibir el servicio. Sobre el

* Entrevista núm. 13 Chihuahua, Chiahuahua.

*Entrevista núm. 140, Chilpancingo, Guerrero.
**Entrevista núm. 232, Veracruz, Veracruz.

primer nivel de atención y el servicio de urgencias se encontró, en todas las regiones estudiadas, la prevalencia de una apreciación general: los servicios públicos, con alguna excepción, son de mala calidad y con una organización deficiente, lo que desalienta su utilización. Las principales quejas señaladas por los distintos entrevistados se pueden englobar en dos categorías:

1. Quejas relacionadas con la organización del servicio

Los problemas que expresan los entrevistados se refieren a una organización fuertemente burocrática que plantea diversas trabas para dar el servicio, a saber: las largas horas de espera, la insuficiencia de las fichas, el diferimiento prolongado de las citas y la rigidez para atender sólo en el turno y clínica asignados, la dificultad para acceder al médico especialista y lograr cumplir con la serie de requisitos para alcanzar un tratamiento o una intervención quirúrgica, entre otros:

> Me voy de aquí desde las ocho de la mañana si es po- sible, a sacar cita, y me dan las doce y todavía no salgo de ahí, de consulta.*

Según los testimonios recogidos, en los servicios de urgencia también se requiere esperar por largo tiempo, y existe la posibilidad de que se niegue la consulta, ya sea porque es necesario pasar primero por el médico familiar o porque al paciente le corresponde otra clínica. La gran mayoría de los entrevistados percibe que solicitar atención médica en estas instituciones implica una relación entre desiguales, en la que no sólo se cuestiona el derecho al servicio o la urgencia del mismo, sino que permite el maltrato de parte de los distintos agentes de salud hacia los individuos:

> ± ¿Y por qué decidió ir con un médico particular y no buscó atención en otro lugar?
> ± Porque si vas a otra institución te tratan como si fueras a pedir limosna.
> ± ¿Como cuáles? ± Simplemente en el ISSSTE, te dan la consulta hasta que se les da la gana, o la ficha, y si llegas después de que repartieron las fichas, ya no te la dan hasta el siguiente día, así estés enfermo [...].**

2. Quejas relacionadas con la atención médica

Uno de los problemas que destacan los entrevistados es la insuficiente capacitación del personal médico y la sustitución de los mismos por pasantes de medicina. Son frecuentes los relatos de los entrevistados sobre diagnósticos inadecuados y negligencia en la atención, y son pocas las situaciones en las que el médico familiar pudo resolver el problema de salud:*

> [...] acabo de ir porque mi niña se fracturó el brazo, y me tuvieron desde las cuatro de la tarde y eran casi las doce de la noche para venirme a decir que no le iban a enyesar el brazo, que la llevara yo hasta el otro día, por- que estaban atendiendo a un señor que estaba muy grave.*

Otro problema referido con frecuencia es la breve duración de la consulta. La prisa para terminar la consulta por parte del médico impide que el paciente aclare dudas, incluyendo el tipo de enfermedad que padece, y que reciba una información adecuada sobre aspectos como los cuidados que requiere, los efectos colaterales de los medicamentos, los síntomas que evidenciarían una complicación, etcétera. Un tercer problema tiene que ver con la desconfianza hacia el tratamiento prescrito y hacia la calidad del medicamento. También es frecuente que se dude de la efectividad de los medicamentos, como resultado de la percepción de que los médicos recetan lo mismo para cualquier enfermedad e incluso de que los medicamentos están rebajados.

Con gran frecuencia esta percepción del servicio forma parte de las condicionantes para la automedicación; ya no sólo se busca prevenir la complicación de una enfermedad sino que también se trata de prevenir la necesidad de acudir al servicio. En todo caso, el peso que esta percepción tenga sobre la selección del servicio depende, esencialmente, de la capacidad de los individuos para afrontar los gastos que implique la utilización de otras alternativas. El sector medio utiliza alternativamente servicios de seguridad social y servicios privados. En términos generales se recurre primero a la seguridad social y si no se logra la

* Entrevista núm. 215, Mérida, Yucatán.
** Entrevista núm. 135, Chilpancingo, Guerrero.

* Es importante enfatizar que aquí se está hablando de percepciones por parte de los usuarios de servicios. Es lógico que dichas percepciones tengan un sesgo, toda vez que lo que queda en la memoria y se trae al relato es precisamente los problemas no resueltos. Es natural que las experiencias en las que sí se resolvieron los problemas ±que sin duda son la mayoría± tiendan a ser olvidadas más fácilmente.
**Entrevista núm. 229, Veracruz, Veracruz.

atención, por las trabas mencionadas, o se desconfía del diagnóstico médico, se recurre al servicio privado.

El acceso a los servicios privados es diferencial entre regiones y ciudades. Para algunas, como en el caso de las regiones centro y PASSPA, predomina la apreciación de que el costo de los servicios privados es muy elevado, aun para los sectores medios. Del análisis de las diversas opiniones expresadas sobre los servicios de salud, se puede concluir que los usuarios de estas regiones enfrentan un dilema: por una parte, sienten que los servicios de salud privados explotan en términos económicos a los pacientes pero, al mismo tiempo, proveen atención y trato humano de buena calidad; por la otra, estiman que los servicios de salud públicos no explotan, pero brindan "un pésimo servicio". En general en los grupos de bajos recursos, y sobre todo en la población sin seguridad social, esta disyuntiva no es tan frecuente. Las opciones entre las que se mueven son la no utilización, en los casos de extrema pobreza, o la selección entre servicios de beneficencia social privada y los de la SSA:

> Vuelve uno porque la situación no está para otra cosa.*

En este sector es menos frecuente la utilización de servicios médicos privados. La principal disyuntiva para la población no derechohabiente del sector bajo se da entre los distintos tipos de servicios de beneficencia social. La búsqueda de atención en la farmacia es una de las opciones que más compiten con la asistencia al médico, entre la población no derechohabiente. Esto tiene que ver con la muy baja capacidad adquisitiva de la población, por lo que los individuos enfrentan la disyuntiva entre pagar la atención médica y el medicamento o sólo pagar este último, como se mencionó anteriormente. La preferencia por pagar sólo el medicamento se sustenta también en una percepción de que en los servicios públicos siempre recetan lo mismo, para cualquier enfermedad, o bien, que lo que recetan muchas veces es demasiado caro. En muchos casos los servicios que dan el medicamento al costo que el paciente puede pagar fueron altamente apreciados y referidos como fuentes de utilización.

En resumen, a la población pobre el dinero le alcanza sólo para una cosa: para pagar la consulta, o para comprar el medicamento, o bien para satisfacer otras necesidades esenciales. Este conflicto explica que los individuos con frecuencia recurran directamente a la automedicación, pues supone un ahorro significativo de dinero.

Un caso particular es la hospitalización. Las opciones para la hospitalización son los servicios públicos, tanto en los sectores bajos como para la mayoría de los individuos de los sectores medios. Este patrón tiene su explicación en el alto costo que implica este tipo de atención en las instituciones privadas. Sin embargo, la población no derechohabiente que acude a los servicios de la SSA se ve obligada a endeudarse o, en el mejor de los casos, a vender algo de la propiedad de la familia para poder pagar una hospitalización.

Conclusiones

Parece claro que no existe una cultura de prevención entre la población. Si bien este fenómeno sólo puede explicarse mediante la conjunción de múltiples factores socioculturales, es indudable que la falta de educación de la población juega un papel muy importante. En consecuencia, es necesario incrementar los esfuerzos educativos para solucionar el problema de la ausencia de cultura preventiva en materia de salud de la población.

Por otra parte, es evidente que entre la población existe una creciente tendencia a funcionar bajo el paradigma de la medicalización, reforzada por razones de orden económico, incluso entre los estratos de nivel medio. Así, parecería que la población en general toma para sí, lo peor de la cultura médica moderna, a saber, la predisposición a utilizar medicamentos y que evita lo mejor de ella: la predisposición para adquirir una cultura de la prevención. Entre otras acciones, es necesario incrementar los esfuerzos educativos para revertir estas tendencias y ampliar la información sobre los riesgos de la automedicación y de la importancia de contar siempre con una opinión médica antes de tomar cualquier medicamento.

La automedicación está reforzada por las condiciones de pobreza en que viven amplios sectores de la población. Los individuos prefieren proceder por cuenta propia, en lugar de tener que realizar el esfuerzo ±económico, de inversión de tiempo, etcétera± que supone la visita al médico. Sin embargo, la reticencia a visitar al médico se fundamenta también en factores que emanan directamente de los servicios de salud. Amplios sectores de la población manifiestan tener más quejas que reconocimientos respecto a estos servicios. En particular, predomina un sentimiento de desconfianza hacia los servicios. Esta desconfianza tiene que ver tanto con la atribución de una insuficiente capacidad técnica, como con la calidad del trato

* Entrevista núm. 169, Pachuca, Hidalgo.

humano que se recibe en las instituciones de salud. En consecuencia, es necesario elevar la calidad de la atención de los prestadores de servicios, con el fin de favorecer una mayor y más oportuna utilización de los mismos.

Muchas quejas se relacionan con la burocratización de los procedimientos para dar la atención, lo cual se traduce en pérdidas de tiempo para los usuarios. Es urgente tomar medidas para incrementar la eficiencia operativa de estos servicios.

Una de las trabas más importantes en la utilización de los servicios de la SSA es la necesidad de pagar, además de la consulta, el medicamento. Para la población que vive en la pobreza, se recomienda otorgar las medicinas sin costo o por medio de un pago no arancelado.

Por otra parte, inclusive en las zonas urbanas existen asentamientos humanos que no disponen de servicios de salud pública y, donde sí los hay, no son ampliamente conocidos o se desconoce la variedad de programas que brindan, lo cual favorece una demanda limitada. Sobre este aspecto es importante continuar con el esfuerzo de ampliar la cobertura de los servicios y, al mismo tiempo, difundir y consolidar su presencia entre la población.

Por último, es fundamental seguir adelante con la investigación social encaminada a estudiar de manera sistemática el punto de vista de la población respecto a los servicios de salud. No es exagerado afirmar que el principal problema asociado a su utilización deriva de la distancia percibida por los usuarios entre ellos y los propios servicios. Sólo en la medida en que se conozcan las características de esta brecha se podrá contribuir efectivamente al desarrollo de políticas y programas encaminados a la reducción de la misma. La investigación, como la indicada en este trabajo, constituye un insumo indispensable para lograr este fin.

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Mobile populations and HIV/AIDS in Central America and Mexico: research for action*

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Introduction

Migration and HIV/ AIDS have been described as associated phenomena since the early stages of studies of HIV/AIDS.[1,2] The reasons *why* migration should be considered an important element in relation to AIDS have been analysed. They include the extensive mobilizations from one country to another, where these countries present differences in HIV profiles and prevention efforts, and the persistence of social inequal ities in health that are frequently reflected in the health of migrants, where the spread of HIV is closely related to social inequalities.[3-5]

Although they differ in some respects, all societies share one common characteristic: those individuals who before the advent of HIV/ AIDS were already marginalized, stigmatized and discriminated, became those most vulnerable to HIV infection.[6-9] The epidemic affects more those whose dignity and human rights are less respected. One response directed to vulnerable groups such as migrants has been formulated by the International Organization for Migration, which together with UNAIDS has subscribed to a cooperation .; agreement to promote a greater awareness about the relationship between migration and HIV/AIDS.[10]

The challenge currently faced by public health is how directly to confront the social conditions that increase vulnerability to HIV/AIDS with actions that involve joint technical and political cooperation by different countries in the various regions of the world for a more efficient use and greater equality in the distribution of the few resources available.

This study is part of the technical cooperation between countries in the region, and its aim is to identify, develop and evaluate strategies and interventions that influence social, cultural, political and health service actions aimed at reducing the vulnerability of mobile populations to sexually transmitted infections (STI)/ HIV/ AIDS in each of the transit stations studied.

Migration, vulnerability and HIV/AIDS

The traditional concept of migration is insufficient for the analysis and comprehension of the role played by population mobility in the transmission of diseases such as those transmitted through sexual practices (STI/ HIV/ AIDS). Therefore, we should refer to the dynamics of population mobility in its diverse forms rather than to the standard concepts of permanent migration (change of place of residence) and temporary migration (such as migration for work purposes: cyclical, seasonal or temporary jobs).

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Social vulnerability is the relative lack of protection in which a group of individuals might find themselves (migrants, the poor, large numbers of young people and women, sexual minorities, individuals with lower educational levels and others) when faced with a potential threat to their health or to the satisfaction of their basic needs. They tend to command less respect for their human rights, as a result of their fewer economic, social and legal resources.[11, p. 221] The difference between risk and vulnerability is far from being a semantic sophistication. Whereas risk indicates probability and evokes a reference to individual conduct, vulnerability is an indicator of social inequity and demands responses at social and political levels.[12-14]

In the case of mobile populations, these groups are vulnerable because their most elemental rights are very often denied in their homelands, in the countries they travel through, and in their final destination. In Latin America, both documented and undocumented migrants face a variety of human rights violations throughout their journey, whereas those who are undocumented certainly suffer the most and are often the least able to approach human rights organizations for protection. [15-17]

This research presents part of the results. of a study aimed at gathering information about the knowledge regarding HIV prevention and transmission among mobile and local populations, as well as the role that various governmental and non-governmental organizations (NGO) play in reducing the vulnerability of local and mobile populations to STI/HIV/AIDS.

Methods

This study took place in 11 transit stations in Mexico and Central America chosen by the National AIDS Programmes in each country (see Fig. 1). The following criteria were used to select the transit stations: a high rate of cross-border movements; a permanent flow of cross-border populations; a high density of bars and brothels; and the presence of NGO involved in the prevention of

Figure I. Map of the selected transit stations

HIV/AIDS or in providing attention to mobile populations. Each transit station represents a somewhat different risk context, and so we consider that each station constitutes a separate case study.

STI/HIV/AIDS and migration surveys were conducted in households chosen through a two-stage cluster sampling procedure in each transit station. Geographical maps of each station were used in the first stage of the sampling procedure to select geographical clusters; in the second stage the households were chosen systematically with equal probabilities proportional to the number of households in each geographic cluster.[18] The sample size, 750 households, was determined using a confidence level of 95%. The informant in each household was an individual older than 16 years of age, preferably the head of the household. A set questionnaire was used to obtain information about the social demographic characteristics of the household members and the informant's knowledge and opinion about STI/HIV/AIDS and mobile populations.

In-depth interviews were conducted with key informants (school teachers, priests, doctors, bar owners and transport workers) and common informants (individuals residing in the locality who hold no official position in an NGO or governmental organization) of the locality, to uncover information about their opinions with respect to HIV/AIDS and to migration, and their interactions with migrants and other mobile populations. Commercial sex workers (CSW) were interviewed as a special subset of this group of key informants, whose information regarding the sexual practices of mobile populations was of particular importance. Sex workers were selected according to the types existing in each transit station. In some transit stations it was important to interview those working in bars, as well as in the street and in brothels. In some sites the nationality of the sex worker was important because undocumented status made them particularly vulnerable to HIV transmission. Sex workers from other countries are often treated differently by local authorities.

In-depth interviews were carried out with migrants and other mobile populations in the process of migrating or being deported to understand their migratory experience and their relationship with STI/HIV/AIDS, both selected according to their age and sex. Qualitative research interviews are conducted until theoretical saturation is reached, that is until stories begin to repeat themselves and no new information is collected in subsequent interviews. Age and sex were thought to be important variables and efforts were made to interview men and women from different age brackets so as to insure that stories were collected from each of these groups.

Semi-estructure in depth interviews and ethnographic research were acrried out over a period of 2 weeks before the start of the study. The latter included registering the material conditions and way of life prevailing in the localities, daily interactions between local and migrant populations, different methods used to cross borders and the interactions between CSW and their clients. Information was gathered about the sexual experiences of mobile populations, CSW and men who have sex with men (MSM) when these were identified to interact with migrants. The first phase of analysis was based on variables identified before the data collection. As new topics emerged from the testimonies, additional variables were created. The theoretical basis used for the qualitative analysis was thus grounded theory, which postulates that theory generation results through the development of categories derived directly from the empirical data.[19]

The numbers of ethnographies, interviews and surveys completed in the 11 transit stations appear in Table 1.

The research teams in each country were selected taking into account their experience in public health research in HIV/ AIDS or migration. The principal investigator for each country and the institution which they worked during the research process appears in the appendix. The teams were multidisciplinary (including physicians, anthropologists, sociologists and epidemiologists), and included individuals from academic institutions, NGO and governmental organizations.

Results

Social contexts

The transit stations in this study belong to three main groups. Those that are cross border include: Tecún Umán, Guatemala; Ciudad Hidalgo, Mexico; Rivas, Nicaragua; and Peñas Blancas, Costa Rica. Those that are border posts include: Chetumal, Mexico; San Cristóbal de la Frontera, El Salvador; Entrada a Copan, Honduras; and Benque Viejo, Belize; and those that are ports include: Mercado Central, Panama; Puerto Barrios, Guatemala; and Belize City, Belize. These three different contexts have different mobile populations. In the cross-border points the bulk of the mobile population is composed of undocumented migrants, in the border posts undocumented migrants are joined by documented migrants and merchants, and the ports have soldiers and sailors as well as merchants. Each

Table I. Field work

Country	Ethnographic Observation	Household survey of local population	In-depth interviews				
			Sex workers	Mobile population	Key and common informants	NGO and GO	MSN
Belize	2	430	18	58	28	18	N/D
Costa Rica	1	363	4	13	9	29	N/D
El Salvador	1	248	12	57	9	6	N/D
Guatemala	2	1118	35	42	68	44	12
Honduras	1	400	7	31	16	21	N/D
Mexico	2	1461	20	43	54	43	N/D
Nicaragua	1	300	17	29	34	15	4
Panama	1	400	2	12	16	6	4
Total	11	4720	115	285	231	182	20

GO, governmental organizations; MSM, men who have with men; NGO, non-governmental organizations; N/D, no-data available.

of these groups has different social contexts and individual abilities for interactions with their vulnerability context. Sailors and transport workers, for example, have the economic resources to purchase goods and services, and are often seen as a benefit to the community into which they arrive. Undocumented migrants who have been deported, on the other hand, lack economic resources, and need support in fighting human rights violations or in defending themselves against other types of aggression. Women in this group are often forced to have 'survival' sex in which condom negotiation is impossible. The transit stations also have CSW, 70% of them in some stations come from countries other than that in which they work, and most of them are undocumented.

In the contexts studied, low levels of education predominate among the resident population, with a mean of 6 years of schooling of all those surveyed with a mean age of 39 years (no-one under 16 years of age was surveyed). Few public services are available, in particular health services. Services targeting the needs of mobile populations, including the defence of their often-violated human rights, are lacking in all but one of the transit stations (Casa del Migrante in Tecún Umán). Violence, poverty and corruption by border authorities and police are common to all the transit stations. Deportees reported mistreatment and violence more frequently, whereas those in process of migrating were more likely to comment on their migration experience and expectations. W omen are often forced to exchange sex in order to cross borders, and these same authorities demand cash from others attempting to cross. In this environment, transactional sex, survival sex and non-consensual sex are carried out in conditions that place individuals at risk of HIV infection; condom use is infrequent. These situations tend to affect migrant women who are already vulnerable for other reasons.

Those interviewed often mentioned the role of religion and religious discourse (protestant, Catholic and others) as relevant, because it can help or hinder the development of prevention strategies. In some instances Catholic religious orders offer HIV prevention information and sometimes even condoms, whereas in other instances Catholic and Protestant officials condemn condom use. Information about the power of religion and religious concepts was also evident in the ethnographic studies, in which individuals often cited that their refusal to use condoms was based on religious belief or when they declared that HIV infection was a matter of God's will not their individual behaviour.

During many of the in-depth interviews, particular groups such as messengers, taxi drivers, tricyclists, truck drivers and sex workers were identified as potential multipliers of information about HIV prevention. In some of transit stations, such as Mercado Central (Panama), Puerto Barrios (Guatemala) and Chetumal (Mexico), MSM were identified as an important target group for interventions because of their frequent interactions with mobile populations. Such interactions often took place under conditions in which safe sex is difficult to maintain,

including heavy drinking. Also MSM often reported at least internal migration within countries to places where sexual experimentation can take place away from close familial ties. In the case of Chetumal, men cross over from Belize in order to do so.

The local population in some of the transit stations perceive mobile populations as the cause of their social ills: violence, prostitution, drug addiction and AIDS 'come from the migrants' (11INFCLTECUN, 2001). The local media publish, on a daily basis, accounts of violence, murder, and assault, reinforcing the rejection of mobile populations. As is evident in Table 2, in these transit stations mobile populations are perceived as troublemakers, who bring few benefits to the local community. It is important to note that the economy of all the transit stations depends heavily on these mobile populations. It is this economic dependence that colours, for example, the difference in perception between the two Mexican sites. In Chetumal, where Belizeans are an important boom to the economy, mobile populations are seen as benefits the community, whereas in Ciudad Hidalgo, where most individuals passing through consist of undocumented migrants on their way to the United States with few economic resources, mobile populations are seen as troublemakers.

Information about HIV prevention and transmission

There is a lack of relationship between the information individuals have about HIV transmission and their own reported behaviours. As is shown in Table 3, high percentages of the population surveyed knew that HIV is transmitted sexually. However, as is show in Table 3, despite having clear information about the sexual transmission of

Table 2. Local populations´ perception of mobile populations

Country transit stations	Are mobile populations seen as problem makers? Yes %	Are mobile populations seen as a benefit to the community? Yes %
Belize		
Benque Viejo (n=147)	42.1	31.9
Belize City (n=242)	22.7	42.1
Costa Rica (n=355)		
La Cruz, Peñas Blancas	41.4	26.4
El Salvador (n=248)		
San Cristóbal, La Frontera	29.0	41.1
Guatemala		
Puerto barrios, Izabal (n=265)	30.5	49.4
Tecún Umán (n=703)	54.3	12.5
Honduras (n=398)		
Entrada a Copán	9.5	26.8
México		
Chetumal (n=531)	25.4	49.3
Ciudad Hidalgo (n=170)	61.1	19.3
Nicaragua (n=300)		
Rivas, Peñas Blancas	20.0	31.0
Panama (n=400)		
Mercado Central	6.2	19.0

Source: Mobile Population and HIV/AIDS Project Household Survey, 2001

Table 3. Information about HIV/AIDS transmission and prevention

Country transit stations	Sexual Transmission Only %	Reported condom use %
Belize		
Benque Viejo (n=142)	94.3	50.3
Belize City (n=241)	89.6	81.1
Costa Rica (n=356)		
La Cruz, Peñas Blancas	87.0	74.5
El Salvador (n=242)		
San Cristóbal, La Frontera	83.8	27.6
Guatemala		
Puerto barrios, Izabal (n=357)	85.4	57.8
Tecún Umán (n=680)	58.2	32.4
Honduras (n=376)		
Entrada a Copán	59.3	30.7
México		
Chetumal (n=517)	23.6	26.1
Ciudad Hidalgo (n=686)	52.0	32.3
Nicaragua (n=297)		
Rivas, Peñas Blancas	50.5	29.0
Panama (n=400)		
Mercado Central	47.7	52.0

Source: Mobile Population and HIV/AIDS Project Household Survey, 2001.

VIH, in only two of transit stations, La Cruz, Costa Rica and Belize City, Belize, was the condom clearly identified as a means of prevention.

Information about HIV transmission co-exists with myths and beliefs about HIV that lead to attitudes of rejection of individuals who are living with HIV/AIDS. As is shown in Table 4 the majority of those surveyed would not consult a doctor who had AIDS, hire someone who had AIDS, or allow their children to play with the children of someone who had AIDS.

CSW often report that they do not use condoms with their lovers because they are not clients, this despite the fact that they know their lovers are not monogamous.

Often HIV and AIDS are connected with 'others': individuals think that 'HIV will not affect me; it only happens to other people'. Some agricultural workers reported that they believe alcohol and perfume applied to the penis will prevent HIV transmission (03MIGCHETMEX). Finally, there are those who have accepted HIV and AIDS as a part of their life and refuse to do anything because they feel it is futile.

Social response

Various organizations present in the different transit stations have developed experience in cross-border collaboration, both formal and informal, for the prevention and control of various health problems (malaria, cholera, dengue, among others). However, they are relatively inexperienced in regional AIDS prevention work. Despite this situation, NGOs were identified in Tecún-Umán that are reducing social vulnerability, have experience in human rights, and work with CSW and MSM, among others. Many of the transit stations have few if any NGOs, and those that have NGOs report that there is little coordination of activities, and that few if any are recognized for doing AIDS prevention work. It became clear, however, that in places where government health services are lacking, NGOs activity could be very important in HIV/AIDS prevention efforts. This is especially the case because mobile populations are also unlikely to approach government services for fear of deportation.

Table 4. Perceptions about people living with HIV/AIDS

Country transit stations	Would consult with doctor with AIDS No %	Would hire someone with AIDS No %	Would allow children to play with children of someone with AIDS No %
Belize			
Benque Viejo (n=147)	72.1	75.5	50.3
Belize City (n=244)	64.3	65.1	40.1
Costa Rica (n=358)			
La Cruz, Peñas Blancas	61.4	89.9	72.3
El Salvador (n=248)			
San Cristóbal, La Frontera	73.3	77.8	66.5
Guatemala			
Puerto barrios, Izabal (n=364)	61.2	63.7	51.1
Tecún Umán (n=703)	84.5	89.6	86.7
Honduras (n=396)			
Entrada a Copán	58.0	81.5	73.9
México			
Chetumal (n=710)	70.9	84.6	80.0
Ciudad Hidalgo (n=531)	46.7	57.2	43.3
Nicaragua (n=300)			
Rivas, Peñas Blancas	64.3	77.6	66.3
Panama (n=400)			
Mercado Central	70.5	86.2	63.2

Source: Mobile Population and HIV/AIDS Project Household Survey, 2001.

Discussion

One of the central elements in the Mobile Populations and AIDS Project is the search for responses to the HIV/ AIDS pandemic that are appropriate to the social, political and cultural conditions of the countries in the Mesoamerican region. The intensity of population mobility within and between countries, and the knowledge that HIV/ AIDS is not a problem that can be confined to political borders, gave the project its regional orientation.

Our research highlights, as other research [20,21] has done, that information about HIV transmission does not necessarily lead to changes in behaviour. The researchers in each of the transit stations found that individuals have a mixture of information about HIV transmission, some of it accurate and some erroneous. All of the researchers agreed that the process of migration increases vulnerability. In some transit stations, reports indicate that over 60% of the women who migrate have forced sexual intercourse at some point in their journey.[16]

Coordination and collaboration among governmental organizations and NGOs present in each transit station will play a key role in the success of the next phase of the project. In many of the transit stations, few NGOs were present. When they were present, there was little coordination among then To aid in the process of designing the intervention, each of the research teams has given a presentation of the results of the study to a community gathering so that they, along with the National AIDS Programmes, can participate in the definition and design of intervention strategies for each specific vulnerability context.

In terms of potential interventions the' cross-border transit stations pro pose the following: creating a local, integrated, multi-user information system to allow for data collection for decision making and integrated action in particular with regards to STI/HIV/AIDS; the formulation of cross-border systems for health services; and campaigns and human rights training for border authorities. The port cities in Panama and Guatemala propose that STI prevention and health promotion campaigns must be more participatory in nature, because the population and the groups interviewed do not feel included in these initiatives. Programmes should target sex workers, MSM and mobile populations currently receiving little or no information on HIV transmission. In Honduras, interventions must stress that HIV infection can affect anyone engaging in high-risk sexual behaviour because the image of the epidemic continues to be linked to so-called 'risk groups'. Interventions must include religious leaders willing to deal with HIV/AIDS within their own settings. In border posts, such as Chetumal, Belize City and El Salvador, interventions could support the formation of NGO, and strengthen the levels of primary healthcare to develop STI/HIV/AIDS prevention programmes.

Throughout the development of this project -from formulation to implementation -there has been strong collaboration between governmental and non-governmental healthcare agencies, academic institutions and technical cooperation agencies. Permanent communication and interaction among the diverse organizations have been constant throughout the project, and can be considered to be a lesson learned about cooperation for equity in health. The technical cooperation model developed by this project is an innovative way for countries to collaborate, in which the scientific, operational and technical capacities available can be used to develop appropriate responses to national and regional contexts. Researchers from diverse professional backgrounds were able to work effectively on the project as a result of the willingness of everyone involved both to teach and to learn.

The participation of the National Institute for Public Health in Mexico, a UNAIDS Collaborative Centre, in the direction and coordination of the first phase of this project, has allowed for the identification and participation of institutions in all of the countries in the region in order to generate quality information for decision making and programme planning.

The need to have quality information about the structural conditions and the social interactions in the various transit stations was an important concern for such a project, which aims to generate information for decision making regarding HIV/AIDS in the region. The information gathered will be utilized in the second phase of the project, which will involve the design and implementation of intervention strategies appropriate to each of the 11 transit stations. A third phase will monitor and evaluate these interventions, so that successful interventions may be replicated in a similar context of vulnerability for STI/HIV/AIDS.

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Appendix

Other participants in this analysis include: Roy Young and Michael Rosberg from the University of Belize; Luis Bernardo Villalobos, Horacio Chamizo, Mario Piedra and Sylvia Mora from the University of Costa Rica; Eliseo Orellana and Víctor Mejía from the University of El Salvador; Manuel Solís and Fernando Cano, from Asociación Salud Integral, and Antonietta Rodríguez from OASIS in Guatemala; Mariela Cortés, Juan M. Ciudad and Claudia Guerrero in Honduras; Daniel Hernández, Sylvia M. Cuadra, Anahi Dreser, Galileo Vargas and Raúl Ortíz from the National Institute for Public Health in Mexico; Rosario Cuadra and Graciella MArsal from Centro de Estudios y Promoción Social in Nicaragua; Rubén O. González from the Centro de Estudios y Acción Social Panameños in Panama.

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Sex work in Mexico: vulnerability of male, travesti, transgender and transsexual sex workers*

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Introduction

Since the first cases of Acquired Immunodeficiency Syndrome (AIDS) were reported in 1981, human immunodeficiency virus (HIV) infection has reached pandemic proportions. In Latin America, the HIV epidemic has largely affected men who have sex with other men (MSM) (Caceres 2002, Sampaio et al. 2002). In Mexico specifically, there is an HIV prevalence of 13.5% among men who have sex with men (Centro Nacional para la Prevención y el Control del VIH/SIDA 2006).

In Mexico, there is growing concern about rising levels of HIV infection among MSM as well as among travestis, transgender and transsexual (TTT) persons. However, there is as yet little information on the distribution of HIV infection among different sub-groups within these populations and even less is known about its patterning among those individuals who sell or trade sex.

Previous studies of both male sex workers (MSW) and TTT sex workers have been undertaken in Mexico and in other Latin American countries to describe the different risks and vulnerabilities of each group. These studies suggest that the differences depend on the money exchanged, sex workers' social organisation, the type of client and the context in which sex work takes place (Liguori and Aggleton 1998, Cuadra-Hernandez et al. 2004). Other studies conducted in Hispanic and Latino communities, such as those of Belza et al. (2001) and Mariño et al. (2003), conclude that HIV prevention programmes on sex work should be more specifically adapted to the needs and circumstances of different groups of MSW and TTTs.

The World Health Organization (2005), the World Bank (1999) and UNAIDS (2004) have all emphasised that key to slowing the spread of HIV are efforts to strengthen the focus on reducing risk and social vulnerability among the most affected social groups. In spite of this, MSWs and TTTs have been absent and almost invisible in the design of public health policies in Mexico. As in many Latin American countries, there are few specific strategies to prevent HIV infection within these groups (Frasca et al. 2000, Piot 2000).

The main objectives of the present study therefore were to provide an account of the social contexts in which MSW and TTT sex workers live, their sexual identities and their sexual practices, while also identifying factors related to their vulnerability to HIV infection in order to provide recommendations for the development of HIV preventive strategies.

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Study design

This was a cross sectional study that combined a range of qualitative methods of data collection, including observational research and in-depth interviews. An initial literature review on sex work, vulnerability, stigma and discrimination informed the construction of an interview guide. We conducted a pilot study to test the guide and to firm up our data collection instruments. Data collection itself took place in Mexico City.

For the main study, sample size was determined by convenience criteria (Robson 2002) and snowball sampling was used to expand the network of key informants over time (Spradley 1980). To identify potential informants, we utilised mapping methodology to identify MSW and TTT sex worker 'gathering points', i.e. places where they tend to look for clients and provide sexual services. Interviews with key informants within non-governmental organisations and the Centro Nacional para la Prevención y el Control del VIH/SIDA (CENSIDA) helped identified potential study sites.

In total, 36 individuals were interviewed divided into two categories. Within the MSW category, men were classified according to the different types of sex work in which they were involved: occasional sex workers, regular sex workers on the street and regular sex workers who advertised on the Internet, in magazines and via agencies. Within the TTT category, informants were divided according to the activity that provided them with their main income: hairdressing, as performers in shows and entertainers and sex work (see Table 1).

Informants were allocated to categories by members of the research team based on the information provided. Data from sex workers who advertised their services through the Internet and agencies are not included in the analysis, as we were not able to collect enough information to strongly characterise this group.

Methods

Data were collected between November 2006 and May 2007. Fieldwork included spending time in and around the places where sex work was offered. The sites included five areas within Mexico City: the Zona Rosa, La Alameda park, Insurgentes, Nuevo Leon, Tlalpan and Revolución. All of these areas are located a little to the south of the city centre. Through field observations, we were able to document social interaction between sex workers and clients and through observation and in-depth conversation we were able to gain insight into the social, cultural, economic and political dimensions of these settings.

The analysis focuses on the following thematic areas: (1) informants' perceptions of their sexual and gender identity; (2) reported sexual practices and condom use; (3) perceptions of HIV in the city; (4) housing, employment, education and health; (5) access to healthcare including counselling and testing for HIV, treatment for sexually transmitted infections (STIs) and treatment for HIV; and (6) stigma and discrimination within the family, healthcare and employment. Individual interviews lasted between one or two hours. All interviews were audio-taped and transcribed.

Table I. Number of informants by type of sex work

Type of sex workers interviewed		
Male sex workers		
Sex work site in Mexico City	**Regular (n)**	**Occasional (n)**
La Alameda and *La Zona Rosa*	Men (both heterosexual and gay) who work on the streets. Some may be living on the street (10)	Men who occasionally sell sex and who not depend exclusively on sex work as their main income (8)
Media workers	Men who advertise their services on the internet, through agencies and in magazines (5)	
Travestis-transgender-transsexual sex workers (TTTs)		
Sex work site in Mexico City	**Regular**	**Occasional**
Insurgentes, Nuevo León, Tlalpan and *Revolución*	TTTs working on the street (4)	Hairdressers (4) Performers in shows or entertainers (5)

Although we knew that mistrust might limit how much informants would tell us about their experiences, we worked closely with a local non-governmental organisation (NGO) that had previously worked with MSWs and TTTs in Mexico City. Some of the people that worked with this NGO were community activists and were able to introduce us to possible informants and helped us break the ice with the interviewees.

Each person interviewed was aware of the objective of the study and the importance of his or her collaboration. We explained that our aim was to understand more about sex work, the impact of HIV and AIDS in the city and issues of stigma and discrimination. In order to undertake this study, we received the approval of the Instituto Nacional de Salud Pública (INSP) ethics and research committees and obtained the informed consent of each participant. When conducting interviews, it was made clear that interviewees had the right to stop the interview at any time. Responses were anonymous to respect confidentiality. We assigned a code number to each interview and kept the list of identities separate from the transcripts and the tapes.

Data analysis

Initial analysis took place while the data was being collected. As a result, we were able to identify a number of preliminary themes in informants' discourse. We also examined regularities, patterns and contradictions between different types of data collected. The topical categories and descriptors employed by respondents were systematically analysed. In order to enhance reliability, we discussed the coding scheme, the development of themes, as well as the interpretation of the data, regularly within the team and with colleagues at INSP.

Results

The main results of the study are summarised in Table 2. In this Table, sex workers are characterised according to the context of sex work; specific social needs; organisation; and access to health services or other social programmes. In general terms, we found that every group was vulnerable but that there were differentiated risks for HIV infection. For example, in sites such as *La Alameda* the most vulnerable group comprised young men ± both heterosexual and gay ± who lived on the streets and for whom economic necessity made them less able to negotiate the use of condoms. The vulnerability of other groups, such as TTT sex workers, was determined by other factors. *Travestis*, transgender and transsexual sex workers typically worked within a more violent environment and have specific health needs related to the use of hormones and surgical procedures.

Socioeconomic characteristics and payment received

Male sex workers working in *La Alameda* were generally of low socioeconomic status. Most had migrated to Mexico City from other states and did not have any permanent place to live. Men in this area tended to stay with relatives, in hotels or on the street and used the money from sex work to cover daily expenses. *Travestis*, transgender and transsexual sex workers from Tlalpan and Insurgentes-Nuevo León, on the other hand, were of middle-socioeconomic status. They charged considerably more for each sexual service provided. Their mean income was between US$600 to US$700 per week. They lived in permanent addresses and many had middle-class aspirations such as buying a car, planning a vacation and moving to a better place.

Costs of sexual services varied according to where MSW and TTTs were based, the method the client used to make contact sex workers, as well as the type of service offered. Charges varied between US$20 and US$150 for penetrative sex. In places such as the Zona Rosa, Insurgentes, Nuevo León and Tlalpan, the price for penetrative sex started at US$50. However, in others, such as La Alameda park, the price per sexual transaction was around US$25. The fees for oral sex were lower than penetrative sex, ranging between US$5 and US$20.

The mean income per month for those working in La Alameda was between US$150±300, averaging about 4±5 clients per week. Informants reported having to move from place to place on a regular basis to access more clients, with demand as well as competition affecting mobility.

Sites and settings

La Alameda and the *Zona Rosa*

Both of these neighbourhoods are open public spaces located in the centre of Mexico City. *La Alameda* is a city park and the *Zona Rosa* is a busy commercial and tourist setting. Within *La Alameda*, there are numerous cultural activities such as street performance, political demonstrations and informal commercial activities. Vastly different

Table 2. Characterisation of sex workers in Mexico City according to different forms of vulnerability.

Group	Site	Type of sex work	Context and vulnerability	Socioeconomic status	Social networks and capacity for mobilization	Access to health care and other social programmes
Young men living in the streets	La Alameda	Occasional and regular sex workers.	Living in the streets in deprived conditions (homeless and jobless) Drug and alcohol use.	Low socioeconomic status.	'Survival' networks for access to food and shelter. Diminished capacities for formal organisation.	Poor access to social and healthcare programmes
Travesti, transgender and transsexual sex workers	Insurgentes, Nuevo León, Tlalpan and Revolución	Regular sex workers. "Occasional sex workers who are also hairdressers and/or who may perform in nightclubs"	Work on the street in a violent environment. Drug and slcohol use Use of hormonoes and surgery to transform their bodies"	Low to middle socioeconomic status.	Numerous conflicts within this group. Heavily stigmatized and discriminated against, even by members of the gay community.	Poor access to social and healthcare programmes. "A few have access to private healthcare practitioners. Poor use of public health services due to fear of discrimination and lack of confidentiality"
Heterosexual and gay men	Zona Rosa and La Alameda	Regular and occasional sex workers.	"Work in the Zona Rosa and in Alameda Park. In Zona Rosa often pay 'commission' to pimps."	Low and middle socioeconomic status.	Strong tradition of social organization and community mobilization within the gay community.	"Some access to private healthcare practitioners Poor use of public health services because of fear of discrimination

social groups interact within the park, including middle- and working-class families, tourists, traders, police officers, gay men, men looking for sex services and MSW (either gay or bisexual). Male sex workers usually stand along park walkways and around the fountains while waiting for a client. Typically they and the majority of their clients, have a low socioeconomic status. Generally, there is a sense of safety in and around the park and no violent incidents were reported during this study.

The *Zona Rosa* is a middle- to high-class neighbourhood. For many years, it has been a gay gathering centre with many gay bars, clubs, discotheques and shopping centres. In the *Zona Rosa*, sex work is most frequently conducted on Hamburgo Street. Similar to *La Alameda*, sex workers stand in the street and wait for clients. Negotiations occur on the spot and then they go to a nearby motel, hotel or car. In contrast to *La Alameda*, the majority of MSW in the *Zona Rosa* are gay men, with TTT sex workers forming a minority. According to the interviewee, a number of pimps control MSW in the *Zona Rosa* and charge them a fee for working on the street. Male sex workers in *La Alameda* and in the *Zona Rosa* vary in age between 16 and 26 years. They have generally completed between three and nine years of formal education and come from a low socioeconomic background. In general, they do not have large families to support since they usually live alone, with their families or with other friends. Only a few interviewees mentioned that someone else was economically dependent on them, most typically their partner or mother. Men in this group typically re-

ported having their first transactional sexual experience had been around between 14 to 20 years of age and their sexual identities varied from bisexual to gay. Some had regular female partners with whom they lived.

Male sex workers working in *La Alameda* and the *Zona Rosa* came from different parts of Mexico. Typically, they had arrived in Mexico City after running away from home because of abuse and (for those who were gay) discrimination within their families and local communities. Some had stayed with relatives, but had found themselves facing the same discrimination and stigma they suffered in their home communities:

> I decided to leave my family because my uncle sexually abused me. I am gay and that caused me a lot of problems and [so I] decided to come to Mexico City. I arrived here to live with relatives and as soon as my uncle noticed that I was gay he kicked me out. I arrived here in La Alameda because of my friends and I work because I need the money. (MSW in La Alameda)

When on their own, they would find others in their similar situation through friends and the people they met in gay clubs, bars or at college. At first, they went out to meet people, but eventually got involved in sex work. Some provided sex in exchange for money or gifts. However, many reported that they did so in order to fulfil their own emotional needs. Some had traditional jobs in local markets and stores, but wages were low, so sex work was used to supplement their income.

Sex work among men in *La Alameda* tended to take place in restaurant toilets, in cars, hotels or within the park itself. Some young men appeared to have an arrangement with hotels where they could stay overnight if they brought their clients back. According to their testimonies, many MSWs preferred to work in *La Alameda* because they felt more secure and did not have to pay for protection or to work.

The MSWs generally did not disclose their activities as sex workers to anyone because of stigma related to homosexuality and to sex work:

> I think I am heterosexual because I like women, but maybe I am homosexual because I have sex with men, but I like women. I even have a girlfriend and also I am going out with another girl that works around here. They do not know that I am a prostitute. If they knew, I am sure they would not talk to me again. If my mother knew, I would kill myself. (MSW in La Alameda)

> My mother and my sisters know that I like other men but they do not know what I do to get money (sex work). I do not want my uncles and friends to know that I like other men. They would reject me and I would never see them again. They would not invite me to play football any more. (MSW in La Alameda)

The sexual services informants provided tended to vary according to sexual identity. In the La Alameda, many heterosexually identified MSWs considered themselves to be 'men' and reported that they were active in sexual anal intercourse and received, but did not give, oral sex to clients:

> Part of what I do is to receive oral sex and to let the client masturbate me. I may kiss them but I never give oral sex to the client or let them penetrate me. (MSW in La Alameda)

Sex workers who identified as heterosexual arguably felt they would be less stigmatised and discriminated against for their behaviour than would be men who self-identified as gay. Many men considered playing an 'active' role when having anal sex with another man as an accepted normality that did not call into question their masculinity. In *La Alameda*, there was evidence of drug and alcohol use among MSWs. Many men drank beer and smoked marihuana; and a few inhaled solvents and glue. Around 30 young MSWs had established an informal network that helped them access food and shelter. The group had an arrangement with two or three hotel owners in *La Alameda*. If they brought their clients to these hotels, they were allowed to stay overnight.

Insurgentes, *Nuevo León* and *Tlalpan*

Insurgentes and *Nuevo León* are two city streets located in the centre-south of Mexico City. In each of these areas, we recruited a number TTTs participating in sex work. The mean age of the TTT informants was 24. Typically, informants were middle-class, based the amount of bodily transformation they had undergone and the type of clothes they wore. They tended to stand along these two streets waiting for their clients, who also appeared to be middle-class, judging by the cars they drove. Negotiations for sex tended to take place in the street and once a price had been agreed, the sex worker would get into the client's car so they could drive to a nearby hotel.

Tlalpan is another area located in the south of Mexico City. Sex work occurs along a five to- eight kilometre

stretch of the main street. In this area, women sex workers and TTTs occupy different locations on the street. There are numerous bars, cantinas and hotels in this section of *Tlalpan*. The majority of sex workers can be found around the hotels, where the demand for sex is high. The socioeconomic status of clients and sex workers vary considerably in this area, as does the degree of economic investment in appearance and physical transformation among members of TTT group. Even with continuous police round-ups, this is not a secure area of the city, with pimps controlling different groups of sex workers. According to the testimonies elicited, sex workers must pay a pimp in order to work and sometimes they even have to physically fight and win their right to work in the street. In order to work in the main two blocks, TTTs have to appear beautiful and invest money in their appearance and their body.

Travestis, transgender and transsexual informants were between 21 and 44 years of age and the majority came from a low-socioeconomic background. Interviewees had between 9 and 12 years of formal education. They came from different states across the country, mainly rural communities, to Mexico City looking for a better life. Typically, TTTs involved in sex work also worked in hairdressing, as entertainers in shows or in bars.

Travestis, transgender and transsexuals were more likely to have a regular partner than MSWs and none reported having economic dependants. Two TTT informants knew that they were living with HIV and were receiving care and antiretroviral treatment. Physical abuse, including abuse by family members, was also reported within this group. Informants reported having their first transactional sex experience between 14 and 16 years of age and all described their sexual identity as homosexual, whilst their gender identity varied from hombres muy afeminados or 'feminine men' to mujeres completas or 'complete women'. *Travestis*, transgender and transsexuals are commonly rejected and suffer stigma and discrimination even from the gay community. Many gay men equate being a TTT to being a thief or a drug user. One of the most important problems TTTs identified was that arising when their legal documents did not match their perceived self-identity:

> In any legal document I am a man and I accept that, but I also perceive myself as having a female identity. I would like be a woman. So I feel like I'm living on the edge. (TTT hairstylist and occasional sex worker)

According to interviewees, TTTs experienced constant physical and emotional violence while selling sex in the street. There is little feeling of belonging to a specific social group:

> We face discrimination because we are feminine men and other gay men do not understand that. They reject our femininity. There is also a lot of envy between travestis, transgender and transsexuals. The envy is because one is more beautiful than the other and may have more clients and gain more money. (TTT in La Alameda)
>
> There is a lot of machismo since men do not like a man that dresses as a woman. Some may laugh at us. I have been beaten up in the street and discriminated against even by the gay community. I was put in jail because I was accused of stealing in a grocery store. The owner did not want me hanging around the area and he lied about me being caught stealing. I was raped by the police and the prison officers, they cut my hair and beat me up badly. (TTT hairstylist in Zona Rosa)

Travestis, transgender and transsexual sex workers experience worse violence than MSWs, although those who work in bars and clubs or in beauty salons were to a degree protected. Members of the group face violence, abuse, unemployment, discrimination within their homes, stigma within the wider community and difficulty establishing supportive social networks. Their social trajectories varied. Some might, at a particular time in their lives, be both performers in shows or entertainers and sex workers. Others may have started off as sex workers but become hairstylists at the time of the study. TTT informants said that becoming a hairstylist or owning a beauty salon was a signal of success since they would not have to work in the streets again. Nevertheless, TTT hairstylists told us that they missed the glamour and competitiveness to get greater numbers of clients. At the same time, however, the beauty salon could be a safer place to have sex.

Condom use and preventive strategies

In interview, both types of sex workers indicated that condoms were used in the vast majority of transactions, particularly when the service included penetration. They also mentioned consistent refusal on their part to have penetrative sex if the client did not want to use a condom or if a condom was not available. We did not find anyone who said that they had been forced to have sex without a condom. However, there was mention of other sexual practices, such as oral sex, where a condom was not used regularly:

> I know that condoms protect against STDs and HIV, but I like to receive oral sex without a condom. If I see that his penis is dirty then I use a condom, but if the client looks clean then there is no problem. I do not like condoms because of the taste of latex. (MSW in La Alameda).
>
> In the past I tried to use a condom every time I had sex but sometimes I didn't use one. I didn't use condoms for oral sex. If the client looked clean I didn't always use a condom for penetrative sex. But now I have more information and I use condoms for everything. (TTT sex worker in Tlalpan)

Some informants mentioned masturbation as a safe practice and a strategy to have more clients and to protect against HIV and other STIs:

> When performing oral sex I might do it correctly at the beginning, but when the client starts enjoying it, I will start talking to him and I will masturbate him. Also when having sexual intercourse I close my legs so that the client's penis does not reach my anus. Basically he will be fucking my legs. These are strategies for me. (TTT who does performances and occasional sex work in Tlalpan)

Although most MSWs knew they should be using condoms, they actually used them inconsistently. Included among the factors related to this was lack of information about the risks of different sexual practices. A great majority of MSWs mentioned that the practice of oral sex without the use of condom was a safe sexual practice. Young sex workers were particularly poorly informed. Unsafe sex could be associated with higher fees and was therefore more popular among sex workers in more economic need. Finally, trust in one's partner could lower the likelihood of consistent condom use.

Beyond the issues highlighted above, informants had difficulty meeting their basic needs for food, housing, employment, education, healthcare, HIV testing with pre- and post- counselling and access to condoms. When they had a health problem, they tended to go first to friends and then to a private practitioner, since typically they did not have access to other types of healthcare service. To get an HIV test, most male sex workers went to a private practitioner. They did not use the public healthcare services because they did not believe doctors and nurses working in public health centres would respect their confidentiality. They said they did not feel comfortable in talking to public sector doctors.

Male sex workers and TTTs in all situations did not remember being given information about HIV prevention or free condoms by either public health services or NGOs. They had to buy their own condoms and felt that the information recovered was insufficient. Risk perceptions were high, with informants believing they were at risk of acquiring STIs and HIV because of their sexual practices. They recognised that they were living in a violent and marginalised community and that this determined many of the 'bad things that had happened to them'. Men working in La Alameda felt that they deserved more help since they suffered from hunger and did not have a home, schooling or a proper job. They practiced sex work because they needed the money to live:

> At the beginning I started to sell sex because I liked it. I am gay and have accepted my sexual preference and I wanted to be in this environment and to be paid for having sex. This was nine years ago and now I have tried to stop doing it. I had a partner and we were OK, I was working and we were having a good time. Unfortunately we broke up and now I need some more money and have started selling sex again. There are many times when I even feel sick of myself and my body because of being a puto. (MSW in La Alameda)

For TTTs, another important health need was the need to buy oils and hormones. Many TTT use them incorrectly, take inappropriate doses and damage their skin and muscles by injecting oil. At the time of this study, we could not identify a single official governmental health service that engaged with the health needs of TTT sex workers.

Discussion and conclusions

Numerous studies of HIV-related risk among MSM have pointed to individual factors that lead to unsafe sexual behaviour (Rotheram et al. 1992, Carballo-Dieguez 1996, Pharr 1997, Shifter and Madrigal 1998, Toro Alfonso 2000, Dilorio et al. 2002). However, recent developments encourage us to analyse vulnerability to HIV by focusing on questions of race/ ethnicity, social class, gender power, stigma and discrimination, among other factors (Parker and Aggleton 2003, Gupta et al. 2008).

In this study we have tried to identify social, cultural and socioeconomic factors associated with vulnerability to HIV infection. They include a whole range of structural factors that make MSW and TTT sex workers particularly vulnerable to HIV infection. They include the context where sex workers work, the stigma and discrimination related to sex work, the violence enacted towards TTTs, the low levels of social and legal support and the limited access to healthcare that sex workers have in Mexico City.

Young park-based MSW were more vulnerable to HIV infection than other groups of sex workers because they are jobless, homeless, have only a few years of education and needed money to purchase alcohol and drugs.

Although we tried to typify a range of MSW and TTT sex workers in Mexico City, we were not able to gain access to some particular sex work settings, such as massage parlours and public baths. Male sex workers located in these locations were not willing to be interviewed. We also had limited success in gaining information about specific sexual practices among the different groups of sex workers. Thus, we did not have enough information either to characterise the complete range of MSW and TTT sex work as we had hoped or to describe the specific risks different kinds of sex workers faced.

What was noticeable, however, was the complete absence of healthcare services directed to both MSW and TTT sex workers. Neither group had access to health services, health information about risky sexual practices or specific strategies to negotiate condom use with clients, HIV/STI testing or counselling and health services for treatment and control of HIV/ STIs. Additionally, TTT sex workers did not have access to access to health services relevant to their health needs arising from the inappropriate use of hormones and oil.

Several sex workers mentioned that they had been forced to move from their hometowns in Veracruz, Morelos, Puebla, and Oaxaca to Mexico City because of the stigma they faced within their places of origin, particularly the discrimination enacted upon them by their families. The most common forms of discrimination they had experienced were social rejection, isolation, gossiping and even physical abuse and sexual violence. Some young men had difficulties settling down in Mexico City because of their lack of social networks within the city. Although some have been able to develop survival networks with other young men, particularly those who work in La Alameda, they still did not have access to healthcare, food, housing and employment.

Travestis, transgender and transsexual sex workers were the group most affected by stigma and discrimination. They reported multiple instances of physical and psychological abuse, not only at the hands of their clients and the police, but also from other MSW and the gay community. Their visibly 'different' appearance and body transformation made them more vulnerable to violence and abuse in the streets.

Despite condom use in many transactions, young MSW in this study were inconsistent in their use of protection. This was the result of their limited knowledge about the risks of specific sexual practices, their lack of experience in sex work and their economic need. This finding relates to other studies that conclude that the practice of unprotected sex is linked to low-socioeconomic status, trust in regular sexual partners, vulnerability due to young age, the use of injection drugs, low levels of social support and a lack of condom availability (Peterson et al. 1992, Carballo-Dieguez and Dolezal 1996, Colby 2003, Dandona et al. 2005). Among sex workers interviewed, however, young MSW showed the greatest willingness to participate in an HIV-prevention programmes. They had more receptive attitudes and tended to feel that they could benefit from regular attendance of prevention counselling sessions and from HIV/STI tests. In contrast, older MSWs and TTTs showed less interest in participating in such activities. This offers hope for the future but points once more to the need for a differentiated and fine-grained response that takes account of different circumstances and needs.

Only when consideration is given to the specific structural vulnerabilities of MSWs and TTT sex workers will we be able to implement appropriate HIV-preventive programmes. Limited access to healthcare, preventive information and condoms; lack of social support from families and community; the absence access to of legal services; ongoing stigma and discrimination; and sexual exploitation and trafficking heighten the vulnerability of members of the groups we have reported on here.

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Participación social en salud: la experiencia del programa de salud materna Arranque Parejo en la Vida*

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La mortalidad materna se ha reconocido como un problema del subdesarrollo en el ámbito global, razón por la cual su disminución se convirtió en una prioridad para las Naciones Unidas y se incluyó como uno de los ocho Objetivos de Desarrollo del Milenio.[1] Como país participante en esta iniciativa, el gobierno mexicano se propuso reducirla en 35% durante el periodo de 2001 a 2006, mediante la institución del programa Arranque Parejo en la Vida (APV), creado en 2001 para atender desafíos de salud materna en estados de alta prioridad.[2,3] La cobertura de sus acciones se extendió de manera paulatina a otras entidades federativas, hasta que el Consejo de Salubridad General acordó su obligatoriedad para instituciones públicas y privadas del país mediante un acuerdo emitido por él a finales de 2004.[4] Asimismo, el Plan Nacional de Salud 2007-2012 retomó entre sus metas dar continuidad a la disminución de la mortalidad materna en municipios de alta prioridad y presenta como medida para tal fin el fortalecimiento de las políticas de salud materna y perinatal.[5]

El diagnóstico realizado por el sector salud al inicio de la administración 2001-2006 mostró que los mayores retos de salud materna y perinatal se encontraban en las regiones con mayor pobreza y marginación.[2] Ante ello, el diseño general del APV propuso la instrumentación federal y estatal de dos grandes paquetes de acciones para su atención: los componentes sustantivos, con acciones dirigidas a la vigilancia epidemiológica activa de los indicadores de condiciones de salud materna (atención médica del embarazo, parto y puerperio) y los estratégicos, con acciones orientadas a favorecer la coordinación de una red para fortalecer la organización comunitaria y mejorar la referencia oportuna de mujeres embarazadas a los servicios de salud.[3]

La red del APV está integrada por los servicios de salud y los servicios de apoyo social: "… La red de servicios de salud incorpora la atención desde el primer nivel, incluyendo las parteras, brigadas, unidades de salud y unidades móviles". Por su parte, la red de apoyo social "… inicia sus acciones desde la comunidad con la promoción entre la población de estilos de vida saludables, (…) involucrando también a las autoridades municipales y grupos organizados de la comunidad, para la referencia a la Clínica (…) que corresponda…".[3]

En este escrito se presentan los resultados de la evaluación de APV que llevó a cabo el Instituto Nacional de Salud Pública en 2006, la cual tuvo un componente de procesos y otro de análisis de impacto. Este análisis corresponde al componente de procesos y se enfoca en la

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implementación de formas de participación comunitaria para la prevención de la mortalidad materna en cuatro estados de México. El artículo describe las características observadas de la red de servicios y revisa las determinantes locales de la participación comunitaria que le confieren diversos grados de funcionalidad.

Una red social puede entenderse como una forma natural de organización entre individuos,[6] para desarrollar funciones específicas a partir de un motivo explícito y un efecto implícito en su estructura.[7] El modelo conceptual del APV se analiza como una red social, lo que hace posible caracterizar su funcionamiento en los estados seleccionados en torno de la referencia de mujeres embarazadas a unidades de atención.

Las acciones del APV relacionadas con la participación comunitaria se concibieron para promover la vinculación de comunidades y autoridades locales con los servicios de salud, con objeto de instalar y operar transporte y posadas para la atención a las mujeres embarazadas. También se buscó garantizar la articulación de los servicios médicos institucionales de todos los niveles, así como los servicios comunitarios existentes mediante la coordinación del apoyo social ante situaciones de emergencia.[3] La evaluación realizada se propuso identificar el cumplimiento de estos objetivos a la luz de la perspectiva de actores de los niveles estatal y local, las características de los contenidos de la participación social y los procesos y apoyos documentados.

Los resultados obtenidos pueden tener implicaciones en la focalización de acciones, la equidad, la provisión de servicios de salud y el tipo de medidas de suministro de servicios para grupos vulnerables. Se considera que las oportunidades y retos documentados pueden favorecer la conformación de redes de apoyo comunitarias efectivas para la aplicación de medidas que impliquen la participación comunitaria para el cumplimiento de sus objetivos.

Material y métodos

Se realizó un estudio cualitativo transversal y comparativo. La recolección de la información se realizó de octubre de 2005 a enero de 2006 en los estados de Chiapas, Guerrero, Hidalgo y Sonora, cuya selección se efectuó tras contrastar contextos de alta y baja mortalidad materna y desempeños eficientes y deficientes de los servicios estatales de salud. Este criterio permitió incluir a entidades con un buen desempeño de las iniciativas del APV y estados con una aplicación deficitaria. Chiapas y Guerrero tuvieron durante el periodo 2000-2004 las tasas de mortalidad materna e infantil más altas del país. Hidalgo fue uno de los pocos casos que instituyó la totalidad de las acciones del APV, mientras que Sonora no recibió apoyo federal directo del APV y notificó una de las tasas de mortalidad materna e infantil más bajas de México.[8]

La evaluación buscó contrastar experiencias y lecciones que permitieran la utilización de los resultados para el aprendizaje mediante la difusión de prácticas específicas;[9] con ese fin se usó un criterio diferenciado para la selección de las unidades de observación. En todos los estados se trabajó en las jurisdicciones sanitarias de las capitales dado que concentraban las unidades de mayor capacidad y eran las cedes administrativas de los servicios. Este ejercicio se complementó con la selección de jurisdicciones rurales en las que había unidades utilizadas por población rural e indígena. Es importante señalar que en los casos de Guerrero y Chiapas, las jurisdicciones rurales seleccionadas respondieron a una situación intencional. En el primer caso se seleccionó la que notificó la tasa de mortalidad materna más alta del país, mientras que en Chiapas se seleccionó la que comunicó el mayor grado de cambio. No obstante sus contextos de pobreza, y pese a que en ambas hubo referencia de apoyos de distintos órdenes de gobierno, la jurisdicción seleccionada en Chiapas resultó relevante por ser además un enclave del Ejército Zapatista. En cada jurisdicción sanitaria se seleccionaron un hospital y dos centros de salud vinculados por el sistema de referencia y contrarreferencia local.

Se integró una brigada multidisciplinaria compuesta por dos médicas, dos antropólogas, una administradora de servicios de salud y un analista de políticas de salud. Este personal aplicó las siguientes técnicas de investigación: observación directa no participativa, entrevistas semiestructuradas, listas de verificación y mapeo político. Los universos de estudio y las actividades de campo se dividieron en dos grupos:

1. Servicios de salud. Se visitaron cuatro sedes de sistemas estatales de salud, ocho centros de salud, cuatro hospitales integrales rurales, cuatro hospitales estatales, tres posadas maternas y ocho oficinas jurisdiccionales.
2. Población. Se entrevistó, previo consentimiento informado, a 80 usuarias embarazadas y puérperas, 17 parteras, ocho funcionarios municipales, 20 proveedores de primer y segundo niveles de atención, nueve decisores jurisdiccionales, ocho decisores estatales y siete decisores federales. Con estos informantes se indagaron experiencias de participación comunitaria para el traslado de urgencias obstétricas mediante redes de apoyo.

El análisis de la información se realizó mediante matrices de relación de variables y codificación por medio del software Atlas-Ti. Las entrevistas se analizaron por tipo de informante y se emplearon como criterios de codificación palabras clave relacionadas con temas específicos de cada acción evaluada. Se establecieron gradientes de desempeño basados en los testimonios de los informantes, los cuales se complementaron con observaciones de campo e información secundaria de los servicios estatales de salud.

Resultados

Para analizar las dimensiones de la participación comunitaria en relación con el APV, se identificó a actores y procesos que favorecieran la disponibilidad de transporte y albergue para las mujeres embarazadas y sus hijos menores, como parte del proceso de atención de episodios obstétricos y pediátricos. Se exploró el papel de las autoridades estatales y municipales en el apoyo a la referencia de casos complicados, así como los acuerdos suscritos entre estas autoridades y los proveedores de servicios comunitarios. También se documentaron las experiencias de apoyo informadas por las usuarias y la participación de parteras tradicionales en zonas de difícil acceso en los cuidados maternos.

1. Actores y procesos de la participación comunitaria

Los principales actores identificados en los cuatro estados en cuanto al apoyo comunitario de problemas obstétricos fueron: tomadores de decisiones estatales y jurisdiccionales, proveedores de servicios de primer nivel, proveedores de servicios de segundo nivel, autoridades municipales, transportistas, voluntarios, parteras, parientes y usuarias. La vinculación de los actores fue más favorable donde había mayor asignación y disponibilidad de recursos (cuadro I).

Los estados en los que se observaron efectos más favorables de la vinculación de actores fueron Chiapas y Sonora, donde autoridades, parientes, voluntarios y usuarios apoyaron la referencia de urgencias obstétricas, la identificación de mujeres embarazadas en zonas aisladas y la referencia de éstas a los servicios de salud. Se verificó que en ambos casos estos apoyos los identificara la población que habitaba las áreas de más difícil acceso.

Los principales apoyos gubernamentales en tres estados fueron la asignación de ambulancias a los ayuntamientos (se encontraron en todos los casos testimonios de munícipes que favorecieron el apoyo de las acciones del APV para la vigilancia del embarazo), la referencia oportuna de casos complicados y el apoyo a parteras tradicionales. Personal de las unidades de salud de esos estados señaló también que se coordinó con representantes de las comunidades mediante la formación de comités para el transporte y la referencia de pacientes.

Un aspecto relevante de la participación de actores del nivel estatal fue la gestión y asignación de recursos adicionales a los suministrados por la federación. En Chiapas y Sonora se notificó la vinculación de acciones del APV con otros programas estatales y federales, como *Oportunidades* y el Seguro Popular de Salud. En Chiapas

Cuadro I. Recursos derivados de la vinculación de actores

Estado	Recursos gubernamentales	Voluntariado	Apoyos municipales	Proceso favorecido
Chiapas	- Nómina municipal - Apoyos extraordinarios de programas estatales - Ambulancias municipales	- Aseo de las posadas - Acompañamiento a las embarazadas - Apoyos materiales de vecinos	- Pago de choferes	- Referencia de casos - Censos de embarazadas
Guerrero	- Fondos municipales	- Comités de transporte	- Pago de choferes	- Referencia de casos
Hidalgo	- Ambulancias municipales	- Apoyo de la Secretaría de Seguridad Pública	- Pago de choferes	- Referencia de casos
Sonora	- Vehículos del ayuntamiento - Ambulancias municipales - Apoyos extraordinarios de programas estatales	- Comités de transporte - Aseo de las posadas	- Transporte de brigadas de salud - Pago de choferes - Ambulancia aérea	- Control prenatal - Referencia de casos

se aplicó el programa estatal Vida Mejor y en Sonora la iniciativa Bienvenidos Todos los Nuevos Sonorenses. El primer caso consistió en un paquete de servicios de atención primaria a la salud financiado con recursos estatales para municipios con muy alta marginación. El segundo se refirió a una serie de servicios de atención del embarazo, el parto y la salud de los recién nacidos auspiciado también por el gobierno estatal. En realidad, el APV no operó como tal en Sonora ni contó con recursos federales. Más aún, el gobierno de Sonora donó a los servicios estatales de salud una ambulancia aérea, en virtud de las enormes distancias por cubrir en el estado. En ambos casos, actores comunitarios y usuarias comentaron que se han desarrollado mecanismos para una identificación más eficiente de las mujeres embarazadas con riesgos de complicaciones, como la vigilancia por parte de vecinas y parteras comunitarias. Estos programas resultaron relevantes porque tuvieron componentes de asistencia a pacientes embarazadas e integraron padrones de usuarias, los cuales se valoraron en estos estados como confiables por parte de los proveedores de servicios y los trabajadores de los ayuntamientos.

En Guerrero hubo frecuentes comentarios sobre limitaciones en cuanto a la vinculación gubernamental y la ausencia de bases comunitarias de participación, como las descritas para los otros estados, si bien se notificaron casos de pago de choferes para el transporte de casos críticos.

El voluntariado informó mecanismos de participación y coordinación, como la creación de comités comunitarios para apoyar acciones de los servicios de salud. En Sonora, los comités funcionaron bajo la supervisión de los ayuntamientos, mientras que en Chiapas se coordinaron con los servicios de salud. Estos comités se conformaron con representantes de los servicios de salud y los ayuntamientos y se delinearon mecanismos para la disponibilidad de transporte y choferes. En Guerrero e Hidalgo se comunicó la creación de un fondo para pagos y asegurar con ello la solvencia de recursos para situaciones de emergencia.

En los cuatro estados, las autoridades municipales entrevistadas señalaron que habían apoyado los trabajos de los equipos de salud ambulatorios en comunidades de difícil acceso. Hidalgo fue la única entidad que recibió apoyo de la Secretaría de Seguridad Pública del gobierno estatal para la salvaguarda de la ambulancia.

Los retos de vinculación identificados se relacionaron con problemas de seguimiento sistemático de los casos referidos y barreras culturales de accesibilidad a servicios de salud en zonas de diversidad cultural. En el primer caso se encontró que no se usaban formatos ni mecanismos de control de las referencias de urgencias obstétricas en los ayuntamientos visitados. Por su parte, las mayores barreras para la vinculación con usuarias y otros componentes de los recursos comunitarios como las parteras se reconocieron en las jurisdicciones sanitarias donde se atendía a población rural e indígena.

2. Instalación y operación de transporte y posadas maternas

En este apartado se describen mecanismos y factores que favorecieron una coordinación eficiente del transporte de personas con urgencias obstétricas y la disponibilidad de posadas maternas. El APV establece que ambos recursos deben tener el apoyo de las comunidades, como resultado de la vinculación establecida entre los actores para un mejor acompañamiento de las usuarias en estado crítico por parte de familiares o parteras.

La estructura observada del servicio de transporte sugiere que hubo adaptación a las condiciones de cada estado y que desempeñó un papel importante la instalación adicional de sistemas de radiotelefonía para la atención de urgencias, como se notificó en Hidalgo y Sonora. En términos de su adecuación, en estos estados se observó que las ambulancias municipales estaban mejor equipadas. Chiapas fue el único estado en el que se encontró un sistema municipal de ambulancias, en el cual el gobierno estatal asignó una ambulancia equipada a todas sus cabeceras municipales.

No obstante la mención de su disponibilidad, en los cuatro estados se indicó que la demanda de traslados de mujeres embarazadas no era muy alta, por lo que este servicio se concedió a otras urgencias. Los informantes de los ayuntamientos de más difícil acceso abundaron en la importancia de este recurso, dadas las distancias y el tiempo que tomaba recorrerlas en condiciones adversas. Las situaciones más dramáticas proceden de Guerrero y Chiapas, donde se refirió que era necesario transportar a pie a las mujeres entre varias personas en hamacas o camillas de varas, debido a que en diversas circunstancias no fue posible el acceso a vehículos automotores.

En las entrevistas con usuarias se detectó el pago de cuotas por servicios de traslado en Sonora, Hidalgo y Guerrero. Chiapas fue el único caso en el que no se registraron pagos por servicio, puesto que se incluyó como parte de él el retorno de los beneficiarios a sus comunidades. Los montos de las erogaciones fluctuaron entre 20 y 200 pesos por viaje y fueron objeto de queja de algunas de las informantes.

En el cuadro II se presenta la situación encontrada en posadas seleccionadas al momento de la evaluación. Su

Cuadro II. Características operativas de las posadas maternas

Estado	Ubicación	Vinculación con servicios de salud	Vinculación con otras dependencias	Disponibilidad durante la evaluación	Denominación
Chiapas	- Comitán - Las Margaritas	- Hospital de Comitán - Hospital Integral de Las Margaritas	Ayuntamientos	+++	Casa Materna
Guerrero	Tlapa	- Hospital General de Tlapa - Hospital de la Mujer	CONADEPI	++	Posada AME
Sonora	Hermosillo	- Hospital Infantil - Hospital de la Mujer	Gobierno del estado de Sonora	+++	Posada Materna

Desempeño: +++ = alto; ++ = medio; + = bajo

disponibilidad se verificó en Sonora, Guerrero y Chiapas, tras observar que estuvieran en funcionamiento. Sólo en Guerrero se encontró la llamada "Posada AME" utilizada por el APV. En los casos de Chiapas y Sonora se emplearon denominaciones locales, como "Casa Materna" y "Posada Materna", respectivamente. Las posadas en los tres casos observados se localizaron en zonas contiguas a un hospital.

Se observó en Chiapas y Guerrero que las posadas estaban disponibles en las jurisdicciones sanitarias rurales seleccionadas, mientras que en Sonora la posada se encontró en la capital estatal. En los tres estados, las posadas funcionaban y daban servicios gratuitos a las usuarias y sus parientes. Las usuarias valoraron en buenos términos su disponibilidad .

Para su funcionamiento, el cuadro II muestra que las posadas se relacionaron con distintas instancias gubernamentales. En Sonora, la Posada Materna se halla frente al Hospital Infantil y el Hospital de la Mujer (ambos vecinos) y ofrece alojamiento a las mujeres, los niños y sus parientes; su operación tiene el apoyo del gobierno estatal. En Guerrero, la posada se encuentra en las instalaciones de la Comisión Nacional para el Desarrollo de los Pueblos Indígenas (antes Instituto Nacional Indigenista) de Tlapa, frente al recién inaugurado Hospital de la Mujer. Se comentó que existían limitaciones financieras en su operación. En Comitán y Las Margaritas se identificaron las facilidades más completas para apoyar a las mujeres embarazadas y sus parientes y se concedió un apoyo notable por parte de los ayuntamientos. El logro de estos apoyos fue reconocido con el Premio de Excelencia APV en 2005 y 2006.

Las posadas maternas reconocidas al momento de la evaluación dieron servicio a un promedio de tres mujeres cada una; se observó además que las usuarias iban acompañadas en promedio por dos personas. Las usuarias entrevistadas indicaron que procedían de municipios cercanos a la ubicación de la posada y fue evidente asimismo la participación del voluntariado, parteras y familiares en su aseo y la preparación de los alimentos, los cuales estuvieron disponibles en los tres casos. En todas las oportunidades se informó que la atención no generaba pagos por parte de las usuarias.

3. Articulación de servicios médicos y apoyos comunitarios

Explorar el funcionamiento de los servicios comunitarios fue uno de los aspectos más complejos de la evaluación. Se investigaron los convenios y los acuerdos locales que, en opinión de los informantes, dieron mayor sustento a la vinculación entre autoridades gubernamentales. También se indagó acerca del liderazgo de estos actores y la formalización de la colaboración y la disponibilidad de los recursos. La situación documentada se describe en el cuadro III.

Seis de los ocho informantes municipales entrevistados señalaron que fueron convocados por autoridades sanitarias para apoyar acciones de referencia y atención oportuna de mujeres embarazadas y urgencias obstétricas, en particular el transporte y las posadas maternas. Los altos desempeños notificados para Chiapas, Hidalgo y Sonora se atribuyeron a la participación de autoridades de distintos órdenes de gobierno, mientras que en Guerrero los mecanismos de coordinación mostraron un menor desarrollo.

Una de las dimensiones más reconocidas por proveedores y usuarias de servicios de salud fue el liderazgo de las autoridades en la conducción de las medidas de participación del APV. Ejemplo de ello en los servicios de salud

Cuadro III. Vinculación de autoridades municipales con APV

Estado	Conocimiento de APV	Liderazgo	Formalización de la colaboración	Disponibilidad de los recursos
Chiapas	+++	+++	+++	+++
Guerrero	++	+	++	+
Hidalgo	+++	++	+	++
Sonora	++	+++	++	+++

Desempeño: +++ = alto; ++ = medio; + = bajo

fue la inclusión de los secretarios de salud en Chiapas y Sonora, quienes realizaron seguimiento regular de los casos críticos atendidos en ese momento. En Hidalgo, este reconocimiento fue más notorio en las autoridades municipales, debido a que financiaron al médico y las ambulancias.

En el ámbito municipal, los proveedores y usuarias reconocieron la colaboración de las autoridades en Chiapas, Hidalgo y Sonora. Una de las experiencias más desarrolladas de participación se observó en Chiapas, donde se institucionalizó la colaboración de los presidentes municipales en iniciativas participativas de salud materna como parte de los programas y políticas de bienestar social, a partir de la formulación de planes municipales de desarrollo. En estos planes, los presidentes municipales formalizaron el apoyo a la red municipal de ambulancias, la referencia de urgencias obstétricas a las clínicas de referencia, así como el mantenimiento de las unidades y el apoyo a las posadas y las capacitaciones para la acreditación de parteras.

En opinión de los proveedores de servicios de primer y segundo niveles, la participación y liderazgo de las autoridades favorecieron de manera notoria la vinculación y coordinación de actores clave. Al respecto, los munícipes de los estados evaluados se coordinaron de forma directa con los encargados de las unidades de atención para otorgar los apoyos para transporte y posadas maternas y agilizar la solicitud y la referencia de los pacientes.

Uno de los datos más relevantes sobre la coordinación de actores fue la referencia en Chiapas y Guerrero de la firma de convenios entre autoridades gubernamentales, sanitarias y municipales para formalizar el otorgamiento de los apoyos referidos a las usuarias y los servicios de salud.

Los mayores retos de continuidad se encuentran en el ámbito político. Al respecto, se mencionó que uno de los principales factores que influyeron en la interrupción del apoyo al transporte se vinculaba con cambios de autoridades municipales y estatales. Esto se corroboró en el terreno, debido a que el trabajo de campo coincidió con dos procesos electorales en entidades en las que se realizó esta evaluación; esto obligó a suspender temporalmente el otorgamiento de algunos de estos servicios.

El saldo más negativo de estos procesos se notificó en una de las entidades, que no se menciona por razones de confidencialidad, en la cual proveedores de servicios y munícipes señalaron que el cambio de partido en el gobierno estatal modificó las jurisdicciones sanitarias y ello afectó la continuidad de los apoyos municipales. Esta alteración consistió en el cambio de áreas de adscripción del personal clave que ya se había capacitado en los componentes y las disposiciones del APV para la designación de nuevo personal. En contraste, un proceso similar en Chiapas tuvo un efecto más favorable: se observó que la presión ejercida por el propio gobierno estatal hacia el cumplimiento de objetivos de los programas municipales dio mayores resultados y se mantuvo la continuidad en el otorgamiento de apoyos.

Dado que el programa APV enfatiza que sus acciones están dirigidas en primera instancia a la atención de mujeres embarazadas que viven en condiciones de marginación y a sus hijos menores de dos años, se exploró con usuarias de estas características el apoyo recibido en su comunidad y en los servicios de salud durante el embarazo. Como parte de este ejercicio, se indagó en zonas rurales la vinculación de parteras tradicionales.

Resultó relevante que cerca de la tercera parte de las usuarias entrevistadas señalara barreras de accesibilidad geográficas, económicas y culturales a servicios de salud en los cuatros estados, situación que fue más recurrente en las jurisdicciones sanitarias con demanda significativa de población rural. No obstante que la mayor parte de las informantes recibió atención oportuna con una valoración favorable del trato recibido en las unidades, se recopilaron testimonios de usuarias en tres entidades que se sintieron maltratadas por parte de transportistas y proveedores tanto en el traslado a la unidad como en ésta.

La fuente de apoyo que tuvo la mayor valoración por parte de las usuarias en los cuatro estados provino de sus redes de parentesco. Este apoyo fue reconocido durante el embarazo, en la atención del parto y el cuidado de los niños menores. Si bien se refirió en la mayoría de los casos que el apoyo provenía de mujeres con distinto parentesco (madre, suegra, tía), se observó en las posadas maternas la presencia de acompañantes masculinos, casi siempre las parejas de las usuarias.

En cuanto a las parteras tradicionales, el APV establece la necesidad de su acompañamiento a las mujeres

embarazadas de sus localidades, sobre todo en zonas donde la disponibilidad de personal médico es baja y existe demanda de estos servicios. Para su vinculación con las acciones del APV se estableció que las parteras debían ser capacitadas y acreditadas, para que participaran en la vigilancia de embarazos y el acompañamiento de las usuarias durante el parto y el puerperio.

Se encontró que en los cuatro estados había parteras tradicionales en funciones y que casi todas las parteras entrevistadas habían tenido capacitación en los servicios estatales de salud. Las parteras capacitadas recibieron un maletín con equipo básico (navajas, sábana, báscula, delantal, "sacaflemas", gasas). Para algunas de las entrevistadas este maletín fue una especie de incentivo, mientras que otras señalaron que su contenido no era suficiente para realizar su trabajo.

El apoyo otorgado por estas proveedoras pudo observarse en las posadas maternas; la experiencia más desarrollada y con mayor reconocimiento correspondió al estado de Chiapas. En este caso, las parteras entrevistadas señalaron una vinculación notable con los servicios de salud, favorecida por el apoyo de los presidentes municipales. Estos últimos fueron ampliamente identificados como patrocinadores de los programas de acreditación de parteras, por financiar el traslado desde su comunidad, su albergue, alimentación y los diplomas que les eran otorgados.

Discusión

La evaluación de los componentes participativos del APV permitió analizar las implicaciones relevantes acerca de la implementación de políticas de salud que requieren la vinculación y participación de actores clave, en este caso para la consecución de los objetivos de atención a la salud materna. Los resultados presentados muestran cierta heterogeneidad en las dinámicas locales que favorecieron la relación y coordinación de actores en los componentes participativos del programa. No obstante, se informó que en la mayor parte de los casos se aplicaron acciones participativas del APV con efectos favorables. Dado que no se dispuso de evidencia sobre el funcionamiento de estas redes en todo el país, la evaluación de jurisdicciones seleccionadas permitió extraer lecciones sobre condiciones relacionadas con su funcionamiento.

La información descrita evidencia dinámicas propias de una red social que respondieron a la demanda establecida por el programa; el objetivo de las acciones observadas es el otorgamiento de apoyo para la referencia de casos complicados, como lo expresaron diversos informantes (cuadro IV).

El análisis de los componentes participativos del APV en los estados muestra la relevancia de dos ámbitos de vinculación entre los actores participantes: el de los servicios y el de las comunidades. En el caso de los servicios, fue mayor la referencia a su participación donde hubo mayor relación entre proveedores de servicios de salud y munícipes, además de mayor conocimiento de los usuarios acerca de la forma de acceder al apoyo. Esta coordinación entre proveedores y representantes municipales fue más amplia cuando se formalizó mediante convenios para su operación.

El hecho que, en promedio, la disponibilidad de transporte fuera más amplia en cabeceras municipales y

Cuadro IV. Desempeño de actores y procesos por estado

Actores	Procesos	Desempeños estatales			
		Chiapas	Guerrero	Hidalgo	Sonora
Funcionarios estatales	Apoyo gubernamental	+++	+	++	+++
Munícipes	Apoyo a transporte y posadas	+++	+	++	+++
Proveedores	Referencia y atención oportuna	+++	+	+	+++
Voluntariado	Trabajo comunitario y asistencia en las posadas	+++	+	NA	++
Red de parentesco	Acompañamiento y apoyo en situaciones críticas	++	++	++	++
Parteras	Acompañamiento y atención prenatal y del parto	+++	+	+	+

Desempeño: +++= alto; ++= medio; += bajo; NA= no aplica

unidades de segundo nivel, en comparación con el transporte con recursos humanos y tecnología rudimentarios que tuvo mayor referencia en comunidades rurales, sugiere la necesidad de acercar estos medios a dichas comunidades. El desarrollo de instalaciones comunitarias en zonas rurales requiere todavía un mayor esfuerzo, puesto que resulta notorio que en los casos en los que se concedió mayor respaldo a estas iniciativas se logró una mayor oferta de estos servicios.

El cuadro IV muestra desempeños contrastantes entre entidades con necesidades de salud materna similares, tal y como ocurre en Chiapas y Guerrero. Ambas entidades recibieron apoyo federal por considerarlas de alta prioridad, pero las acciones emprendidas en el nivel local favorecieron una mejora considerable de la atención en Chiapas. Una comparación de este comportamiento con la situación referida en Guerrero sugiere la necesidad de un mayor acompañamiento y fortalecimiento de capacidades locales para la atención de retos en materia de salud materna. Si bien las respuestas descritas sugieren la importancia del respaldo y la formalización de acuerdos, se encontraron barreras de continuidad para las nuevas administraciones municipales ante procesos electorales y cambio de autoridades de distintos niveles.

Respecto del ámbito comunitario, las usuarias expresaron como su principal fuente de apoyo el proveniente de sus redes de parentesco, el cual resultó complementario de las facilidades estudiadas y documentadas con munícipes y proveedores como parte del proceso de atención.

Un análisis más profundo de la vinculación entre los distintos actores de la red para lograr la referencia oportuna de las urgencias obstétricas indica que los alcances encontrados deben tomarse con cautela, dada la reciente aplicación del modelo de red social del APV y la fragilidad de los acuerdos con las autoridades municipales ante procesos políticos regionales. Sin duda, los recursos aportados por estos actores son importantes, pero su temporalidad respecto de otras formas de apoyo comunitario reconocidas por usuarias es más corta.

La vinculación entre los actores de la red social promovida por el programa APV se representa en la figura 1, en la cual se observa que el apoyo más relevante para las usuarias provino de sus redes de parentesco y que ésta es la relación con mayor contenido simbólico y cultural en la red. Este planteamiento concuerda con otros estudios que muestran que las personas mejor identificadas como proveedoras de apoyo están adscritas a la familia cercana,[10] lo que sugiere que el programa podría aprovechar más este

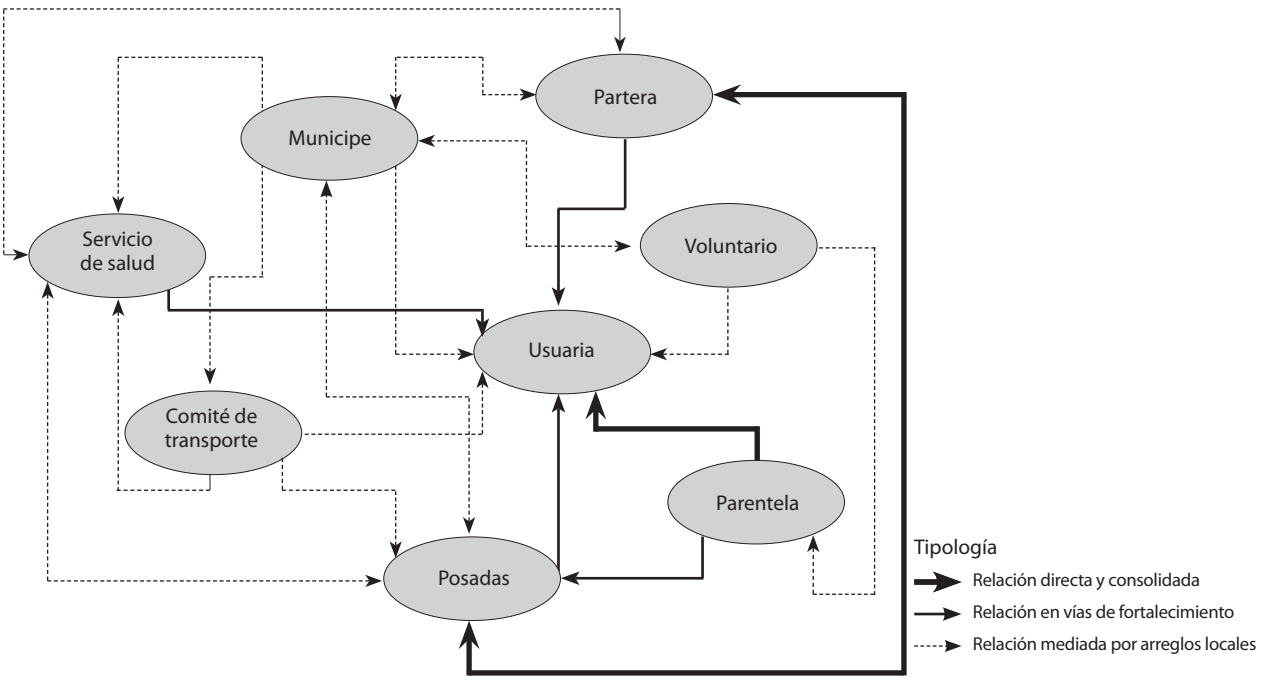

Figura 1. La red funcional

apoyo y los recursos que representa el cumplimiento de sus objetivos. El siguiente grado de vinculación local de las usuarias se establece con las parteras, en particular en zonas con población indígena y rural, y complementa al recibido por el personal de los servicios de salud. Los apoyos otorgados por los munícipes resultaron significativos por la movilización de recursos que éstos lograron. Sin embargo, se requieren mecanismos dirigidos para dar mayor permanencia a estos apoyos y sustento a la red APV.

Conclusiones

La evaluación realizada a las acciones participativas del programa APV en las jurisdicciones sanitarias estudiadas sugiere que sus medidas para el apoyo de emergencias obstétricas influyeron en la disponibilidad de transporte y el albergue de mujeres embarazadas en posadas maternas. Este resultado fue notificado también en la certificación internacional de las acciones del APV, la cual destaca efectos potenciales del cumplimiento de estas disposiciones en la salud materna mediante la cobertura de la atención obstétrica y la mejora de la calidad de los servicios en esta materia.[11]

Hay coincidencia con otras fuentes[12,13] en relación con la necesidad de fortalecer e incentivar estas medidas en las zonas con mayor mortalidad materna y en localidades rurales e indígenas. La amplia valoración de las redes de parentesco y de las parteras, así como del voluntariado en los albergues, señala la relevancia de haber incorporado estos recursos comunitarios como parte de la red social de apoyo para lograr un acompañamiento más efectivo y la detección oportuna de riesgos obstétricos. Resultaría insuficiente atribuir la funcionalidad del modelo a los servicios de salud y a las autoridades de distintos órdenes de gobierno.

Estas conclusiones pueden considerarse en el diseño de nuevos programas, tales como las "Caravanas de Salud" que aplicará la Secretaría de Salud dentro del gobierno en el periodo de 2006 a 2012. Con una mayor participación de los actores comunitarios se logrará una mayor equidad y se creará un sistema de salud más democrático.

Agradecimientos

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Servicios de salud en la Mixteca: utilización y condición de afiliación en hogares de migrantes y no-migrantes a EU*

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El estado de salud es el resultado de las condiciones sociales en que la gente nace, crece, vive, trabaja y envejece, así como de los factores geográficos, culturales, económicos y sociales que determinan el acceso y utilización de los servicios de salud para prevenir y combatir las enfermedades.[1] Bajo este esquema de determinantes sociales de la salud, las condiciones de vida de la población están directamente influenciadas por políticas sociales y económicas, tanto globales como del propio país. En particular, los problemas de salud de las personas están íntimamente vinculados con una distribución desigual del poder, ingresos, bienes y servicios, lo cual se refleja en una deficiente salud entre los más pobres.

La pobreza es el determinante social más importante en el deterioro de la salud.[2] En México, país de ingresos medios, existen 44.7 millones de personas que viven en condiciones de pobreza de patrimonio y 14.4 millones en situación de pobreza alimentaria.[3] Dos de cada tres personas con pobreza alimentaria viven en zonas rurales, en donde la pobreza es más acentuada que en las zonas urbanas y la escasez de recursos institucionales es la norma.[4,5]

En este contexto de desigualdad social se presenta la emigración hacia Estados Unidos (EU) como una alternativa para acceder a mejores condiciones de vida. Millones de mexicanos han emigrado a aquel país, frecuentemente ocupándose en trabajos mal remunerados y de altos riesgos para su salud como en la agricultura, construcción, manufactura y servicios. La migración indocumentada generalmente ocurre al margen de la economía formal y tiene implicaciones políticas, económicas, sociales y de salud para ambos países.[6]

La salud de los migrantes indocumentados y de sus familias que permanecen en México es uno de los retos más importantes para los sistemas de salud, ya que al no laborar en su país y no contar con permisos laborales en EU, los migrantes tienen menor derechohabiencia en México y limitado acceso a los servicios de salud en EU. Esta desprotección social en salud que enfrentan los migrantes mexicanos ha sido objeto de preocupación para ambos países desde hace décadas.[7]

Datos de 2007 sugieren que de los 11.8 millones de mexicanos que viven en EU, 56% (6.7 millones) no contaba con algún tipo de cobertura de salud para atender sus enfermedades.[8] Los problemas de salud reportados con mayor frecuencia entre los migrantes se han encontrado relacionados con estilos de vida cambiantes, demandas laborales excesivas y limitado acceso a servicios de salud.[9,10] Problemas como diabetes, hipertensión, depresión y lesio-

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nes, que entre los migrantes son de prevalencia elevada,[11] requieren de tratamientos especializados y de estrecho seguimiento médico, pero al no utilizar regularmente estos servicios, difícilmente son atendidos con éxito.

Una de las regiones de México con alta tradición migratoria a EU que en la actualidad sigue aportando mano de obra, mayoritariamente masculina, es la denominada Mixteca baja, localizada en la intersección de los estados de Puebla, Guerrero y Oaxaca.[12] En esta región, las actividades laborales mal remuneradas en el sistema agrícola tradicional, junto con la exclusión social y la falta de oportunidades educativas, laborales, económicas y de desarrollo personal,[13, 14] han propiciado la emigración de sus pobladores para trabajar como jornaleros en el corte de caña en Veracruz y de jitomate en los estados de Morelos y Sinaloa. Muchos también migran a EU en búsqueda de una mejor calidad de vida y bienestar tanto individual como familiar.[15-17] La Mixteca baja es una zona rural extremadamente árida, con baja producción agrícola y un alto grado de marginación que se ve reflejado en la gran proporción de viviendas con piso de tierra, sin drenaje y sin agua entubada ni servicios sanitarios. Sus pobladores se caracterizan por tener acceso muy limitado a bienes y servicios públicos, con altos niveles de analfabetismo ±comparados con la tasa nacional± e ingresos menores al salario mínimo.[18]

El presente estudio tuvo como objetivo caracterizar a los hogares de la Mixteca baja en términos socioeconómicos y demográficos, así como analizar las diferencias entre hogares de migrantes y no migrantes en torno a la utilización de servicios de salud.

Material y métodos

Esta contribución se deriva de un proyecto de investigación que se llevó a cabo en el año 2005 en la región mexicana conocida como la Mixteca baja, en tres municipios rurales de los estados de Guerrero, Oaxaca y Puebla, clasificados por el Consejo Nacional de Población (Conapo)19,20 como de "alta" marginación y "muy alta" intensidad migratoria. Los municipios en los que se recolectó la información fueron Tlalixtaquilla de Maldonado, Guerrero; Santo Domingo Tonalá, Oaxaca; y Guadalupe Santana, Puebla.

Con el propósito de establecer un criterio de estratificación de los hogares, se definió un índice de nivel socioeconómico (NSE).21 Dicho índice se construyó a través de la matriz de correlación policórica de un análisis de componentes principales22 y conjuga información sobre las condiciones de infraestructura y posesión de activos en el hogar (variables dicotómicas; sí = 1, no = 0): materiales utilizados para techos, paredes y pisos (durables o no), la existencia o no de servicios de agua entubada y electricidad, así como posesión de estufa, refrigerador, televisores, equipos de sonido, teléfono, lavadora, horno de microondas y computadoras. A partir del indicador de nivel socioeconómico se generaron terciles de distribución de la muestra de análisis, lo cual permitió establecer un criterio de estratificación de la condición económica de los hogares.

Para la descripción de la muestra, se calcularon medidas de tendencia central y de dispersión, para las variables continuas, y de frecuencias y porcentajes, para las variables categóricas, y se realizaron además pruebas de diferencias marginales (al 1, 5 y 10%) de Wald en medias y proporciones de los principales indicadores analizados.

Diseño muestral

El diseño muestral fue parte de un proceso de muestreo por *clusters* al interior de los tres municipios arriba mencionados, multietápico y estratificado por localidades,[23] para el que se construyó un índice de selección aleatoria ponderado por número de hogares, de tal manera que aquellas localidades con mayor número de hogares tuvieran mayor probabilidad de ser seleccionados. Este procedimiento permitió definir un total de 19 localidades en donde se realizó el trabajo de campo (seis en Tlalixtaquilla, seis en Tonalá y siete en Guadalupe), que incluyeron un total de 702 hogares con representatividad regional. En cada unidad doméstica, previa firma de consentimiento informado, se entrevistó al jefe de hogar (JH) y a otros integrantes de la unidad. En este trabajo se reportan únicamente los datos recabados en las encuestas a los JH, quienes proporcionaron información acerca de los 3 841 miembros de las 702 unidades domésticas estudiadas.

Adicionalmente, se realizaron 42 entrevistas semiestructuradas a mujeres encargadas del cuidado de los miembros de las unidades domésticas para explorar varios aspectos del proceso de atención a la salud; aquí sólo reportaremos su experiencia sobre la utilización de servicios de salud. Esta información cualitativa permitió generar líneas explicativas para los resultados numéricos, y es en este sentido que se incorporan en la sección de Discusión del presente trabajo, sin pretensión de ser concluyentes.

Finalmente, las encuestas y entrevistas fueron administradas por personal expresamente capacitado para este propósito. El proyecto fue aprobado por la Comisión de Ética del Instituto Nacional de Salud Pública.

Definición de los hogares migrantes

Los 702 hogares de la muestra fueron caracterizados como uno de dos posibles tipos de hogares: Hogar no migrante (HogNoMig), en el que el jefe de hogar reportó que ninguno de sus miembros había vivido o laborado en EU, y Hogar migrante (HogMig) en el que: 1) al menos un miembro de ese hogar trabajaba en EU (migrante activo), o 2) al menos un miembro de ese hogar había laborado en EU por lo menos durante un año, y al momento de la encuesta residía en la localidad en que se llevó a cabo el estudio (migrante de retorno). Del total de hogares, 39% fueron HogNoMig y 61% HogMig; de los cuales, 31% contaba con migrantes activos, 19% con migrantes de retorno y 11% tenía tanto migrantes activos como de retorno.

Las variables estudiadas en el proyecto de investigación fueron numerosas, pero para el presente trabajo se analizaron únicamente las siguientes: características sociodemográficas de los miembros de las unidades domésticas (edad, sexo, escolaridad, condición laboral), número de integrantes del hogar y características de la vivienda, derechohabiencia al Instituto Mexicano del Seguro Social (IMSS), Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado (ISSSTE), afiliación al Seguro Popular, utilización de servicios de salud y si recibían o no apoyo de programas gubernamentales.

Resultados

El cuadro I describe las principales características de los miembros del hogar y su vivienda, así como las diferencias encontradas entre HogNoMig y HogMig.

En relación a sus integrantes, en todos los hogares se presentaron proporciones semejantes de hombres y mujeres. Los HogMig se caracterizaron por tener, en promedio, integrantes más jóvenes, que hablaban español y contaban con más años de escolaridad (un año más aproximadamente) que sus contrapartes en HogNoMigG (p<0.01). Por su parte, en los HogNoMig se observó que sólo 30% (p<0.01) de sus miembros contaba con trabajo remunerado (7.5% menos que en los HogMig), un mayor porcentaje eran mixteco-hablantes (p<0.01) y analfabetos (alrededor de 3% más, p<0.01), en relación con los HogMig.

Los JH en HogMig, comparados con los HogNoMig, eran en su mayoría hombres, más jóvenes (6 años menos), con aproximadamente un año más de escolaridad y hablaban menos el mixteco; pese a esto no se encontraron diferencias en su incorporación al mercado laboral (alrededor de 64% en ambos tipos de hogares). En cuanto a las características de la vivienda, los HogMig contaban en su mayoría con viviendas propias y tenían un mayor número de habitaciones e integrantes en la unidad doméstica que los HogNoMig (p<0.01).

En dicho cuadro se aprecia también que un mayor porcentaje de HogMig, en relación con los HogNoMig, se ubicaron en el NSE alto (14% más, p<0.01), mientras que la mayoría de los HogNoMig se concentraron en el NSE bajo (13% más, p<0.01). Alrededor de una tercera parte de ambos grupos de hogares se colocaron en el NSE medio. Aunque no se muestra en el cuadro I, cabe mencionar que las viviendas de los HogMig poseían en promedio mejores condiciones de infraestructura (en piso, techo y paredes) y más activos como refrigerador, estufa, televisor, etc. que los HogNoMig.

En los HogMig se identificaron un total de 646 miembros migrantes activos o de retorno. En estos hogares, los jefes de familia reportaron que la mayoría (86.4%) de sus miembros migrantes no contaba con documentos legales para residir y trabajar en EU y que 85.8% mandaba remesas regularmente.*

Con el fin de brindar una idea de los problemas que enfrentan diferencialmente los miembros de HogMig y HogNoMig en esta zona geográfica, el cuadro II proporciona un acercamiento general a algunos indicadores del estado de salud de dos grupos vulnerables: mujeres en edad reproductiva y ancianos (hombres y mujeres). Los padecimientos mostrados fueron diagnosticados por un profesional de la salud en el último año y reportados por los afectados. Las mujeres de HogMig reportaron más enfermedades de transmisión sexual (p>0.15), enfermedades crónicas como hipertensión y diabetes (p>0.1) y, aunque no de manera significativa, más enfermedades infecciosas como tuberculosis y neumonía. Por su parte, entre los ancianos, aunque no se encontraron diferencias estadísticas, aquellos ubicados en HogNoMig reportaron una mayor presencia de enfermedades de los huesos, crónicas, infecciosas y de visión.

El cuadro III presenta datos de afiliación al Programa *Oportunidades*, Seguro Popular y derechohabiencia a instituciones de salud. De los 3 841 miembros de todos los hogares, sólo 716 (18.6% del total de la muestra) eran beneficiarios de *Oportunidades*, con una proporción similar de HogMig y HogNoMig afiliados al mismo. En cuanto a derechohabiencia, 78% de todos los hogares reportó no tener miembros afiliados a instituciones de salud. Al analizar los datos por condición de aseguramiento, encontramos que una proporción significativamente mayor de

Cuadro I. Características sociodemográficas de los participantes por tipo de hogar no migrante y migrante en la Mixteca. México, 2005

Características	Total		HogNoMig		HogMig		Valor p
	N	% o Media	N	Media	N	Media	
De los integrantes del hogar							
Edad en años	3841	29.7	1502	32.3	2339	27.9	0.00
Sexo							
Hombres	3841	48.7	1502	47.1	2339	49.6	0.13
Mujeres	3841	51.3	1502	52.9	2339	50.4	0.13
Trabaja	3710	34.4	1471	29.9	2239	37.4	0.00
Escolaridad en años	3669	4.5	1436	4.1	2233	4.8	0.00
Sin educación	3669	24.1	1436	28.1	2233	21.6	0.00
Alfabeta	3722	74.7	1475	70.7	2247	77.4	0.00
Habla español	3751	97.4	1472	95.9	2279	98.3	0.00
Habla mixteco	3751	17.9	1472	20.2	2279	16.3	0.00
Del jefe de hogar							
Edad en años	696	50.8	326	54.7	370	47.4	0.00
Sexo							
Hombres	693	61.6	325	58.5	368	64.4	0.11
Mujeres	693	38.4	325	41.5	368	35.6	0.11
Trabaja	694	63.8	326	64.4	368	63.3	0.76
Escolaridad en años	683	3.5	316	3.1	367	3.8	0.01
Sin educación	683	31.3	316	37.3	367	26.2	0.00
Alfabeta	691	69.6	325	65.2	366	73.5	0.02
Habla español	695	98.3	326	98.2	369	98.4	0.84
Habla mixteco	695	17.4	326	17.5	369	17.0	0.95
Del hogar							
Número de integrantes	697	4.7	327	4.4	370	4.9	0.01
Número de cuartos	692	3.5	326	3.2	366	3.8	0.00
Vivienda propia	696	84.6	327	82.9	369	86.2	0.00
NSE bajo	698	32.5	328	39.9	370	25.9	0.00
NSE medio	698	32.5	328	32.9	370	32.2	0.84
NSE alto	698	32.4	328	25.6	370	38.4	0.00

HogMig= hogares de migrantes
HogNoMig= hogares de no migrantes

Fuente: Elaboración propia con datos del proyecto "Migración, salud y salud mental en México rural en el contexto de la globalización" 2005

Cuadro II. Problemas de salud en mujeres en edad productiva y ancianos de ambos sexos por tipo de hogar no migrante y migrante en la Mixteca. México, 2005

Padecimiento	Total	HogNoMig	HogMig	Valor p
	%	%	%	
Mujeres	N = 468	N = 195	N = 273	
Enfermedades infecciosas y de transmisión sexual*	40.6	34.6	44.7	0.03
Infecciones de transmisión sexual‡	31.6	26.7	34.8	0.06
Enfermedades infecciosas§	19.7	17.3	21.6	0.24
Enfermedades crónicas#	23.3	19.4	25.6	0.01
Ancianos	N = 295	N = 133	N = 162	
Enfermedades infecciosas&	38.0	40.7	33.1	0.18
Enfermedades crónicas#	42.2	43.8	40.6	0.58
Enfermedades de los huesos[1]	60.7	63.0	57.9	0.35
Enfermedades de los ojos¥	35.7	37.5	34.1	0.55
Accidentesø	6.4	7.5	4.6	0.31

HogMig= hogares de migrantes
HogNoMig= hogares de no migrantes

* Incluye ambos tipos: enfermedades infecciosas y enfermedades de transmisión sexual (ETS)
‡ ETS, flujo vaginal, ardor, comezón vaginal, dolor en vientre bajo
§ Tuberculosis, infección intestinal, neumonía, infección urinaria
# Diabetes, hipertensión, enfermedad del corazón
& Enfermedades pulmonares, tuberculosis, infección urinaria, infección intestinal, infección de la próstata
[1] Osteoporosis, artritis, reumatismo, ácido úrico
¥ Ceguera o algún impedimentos visual
ø Accidentes en general

Fuente: Elaboración propia con datos del proyecto "Migración, salud y salud mental en México rural en el contexto de la globalización" 2005

miembros de HogNoMig que de HogMig estaban afiliados al ISSSTE (p<.0.01) y al Seguro Popular (p<0.05). No se encontraron diferencias en cuanto a derechohabiencia al IMSS, con un porcentaje reducido de afiliación en ambos tipos de hogares.

La parte inferior del cuadro III presenta el lugar a donde acudieron regularmente los miembros de los hogares entrevistados cuando requerían servicios de salud. Como se observa, un porcentaje significativamente mayor (p<0.01) de miembros de HogMig (25.7%) que de HogNoMig (19.7%) acudía a servicios privados de cuidados a la salud. Los HogNoMig utilizaban más los servicios que se ofrecían, tanto en la comunidad a través de los centros de salud locales (p<0.05), como en una combinación de servicios públicos y privados (p<0.05). Finalmente, no se detectaron diferencias significativas entre ambos grupos en el uso regular de servicios de salud ofrecidos por el IMSS o ISSSTE; un porcentaje menor a 6% de los miembros de HogMig y HogNoMig acudían regularmente a las instituciones de salud de las cuales eran derechohabientes.

Discusión

Como se ha mencionado en esta contribución, la Mixteca baja es una región que se caracteriza por tener un elevado nivel de marginación y un alto índice de intensidad migratoria hacia los EU. En este contexto, la migración hacia ese país para muchas familias se ha convertido en una opción de sobrevivencia y bienestar, dadas las escasas oportunidades que existen en la región para el desa-

Cuadro III. Participación en programas sociales, afiliación para recibir atención a la salud y utilización de servicios por tipo de hogar no migrante y migrante en la Mixteca. México, 2005

Características	Total		HogNoMig		HogMig		valor p
	N	% o Media	N	% o Media	N	% o Media	
Beneficiario de algún programa social[1]	3 487	23.7	1 455	20.8	2 032	23.7	0.94
Beneficiario de *Oportunidades*	3 846	18.6	1 509	19.4	2 337	18.0	0.28
Afiliación para recibir servicios médicos							
IMSS	3 872	5.6	1 516	5.9	2 356	5.5	0.60
ISSSTE	3 872	1.9	1 516	3.0	2 356	1.3	0.00
Seguro Popular	3 872	13.6	1 516	15.3	2 356	12.6	0.02
Centro de salud al que acude a atenderse regularmente							
De la comunidad	3 394	57.3	1 469	59.8	1 925	55.4	0.01
Privado	3 394	22.3	1 469	19.7	1 925	25.7	0.00
Privado y de la comunidad	3 394	10.1	1 469	11.6	1 925	8.9	0.01
IMSS/ISSSTE	3 394	5.5	1 469	5.3	1 925	5.6	0.70

* Incluye Oportunidades, Procampo, Piso Firme, Tu Casa, y otros apoyos de entidades federales [Desarrollo Integral de la Familia (DIF)], estatales (Pensión Guerrero) y de la sociedad civil (Niños de México)
IMSS: Instituto Mexicano del Seguro Social
ISSSTE: Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado

Fuente: Elaboración propia con datos del proyecto "Migración, salud y salud mental en México rural en el contexto de la globalización" 2005

rrollo social, económico y personal de sus habitantes. En esta región se observa un estado homogéneo de pobreza generalizada, sin embargo, los hallazgos de este estudio sugieren la existencia de diferencias en características socioeconómicas y demográficas entre los pobladores de la región, concretamente entre hogares que reportan tener al menos un integrante que es migrante (activo o de retorno) a los EU (HogMig) y los hogares que no tienen migrantes (HognoMig) . También se observaron diferencias en la utilización de servicios de salud entre los HogMig y los HogNoMig.

Los resultados de este trabajo sugieren que los HogMig cuentan con mayores recursos personales y económicos que les permiten tener mayor acceso a bienes y servicios, lo cual se traduce en un nivel socioeconómico más alto en comparación con los miembros de los HogNoMig. Asimismo, los HogMig tienen un mayor número de integrantes, son más jóvenes y cuentan con mayor escolaridad en comparación con los HogNoMig.

Al ser la Mixteca baja una zona de alta marginación, llama la atención que menos de una quinta parte de la muestra total de hogares recibía los beneficios de *Oportunidades*, programa que busca fomentar el desarrollo humano de la población en pobreza extrema a través de apoyos en educación, salud, nutrición e ingreso. Una proporción aún menor reportó afiliación al Seguro Popular; no obstante, al ser entrevistadas algunas mujeres señalaron que unas semanas antes de esta encuesta se habían inscrito al Seguro Popular y aún no habían utilizado los servicios que ofrecía ese programa. Sin embargo, sus expectativas no eran positivas, pues estaban basadas en experiencias previas en el centro de salud local y otros servicios de salud y pensaban que el Seguro Popular no respondería adecuadamente a sus necesidades. Lo anterior señala un importante problema de actitud que podría transformarse en conductas de no utilización de estos servicios.

En general existe baja afiliación a los dos sistemas más importantes de seguridad social en México: el IMSS y el

ISSSTE. Asimismo, identificamos diferencias entre los tipos de hogares, con una proporción significativamente mayor de miembros de HogNoMig afiliados al ISSSTE y al Seguro Popular.

La utilización de servicios privados de salud fue mayor en los HogMig, mientras que los HogNoMig utilizaban más los servicios ofrecidos por los centros de salud locales. A pesar de que 57% de los miembros de ambos hogares utilizaba servicios de salud públicos, las mujeres entrevistadas percibían que éstos eran de baja calidad y manifestaron que preferían acudir a servicios privados. Percibían también que la mayoría de las personas que contaban con derechohabiencia en el IMSS o ISSSTE no utilizaban estos servicios debido al gasto y tiempo que implicaba transportarse a las comunidades en donde se localizaban estas instituciones y acudían entonces a los centros de salud locales o a médicos privados. Esta percepción de baja calidad podría explicar por qué, cuando tienen la posibilidad, prefieren pagar servicios de salud privados; además, denota insatisfacción con un servicio al que acuden por ser la única opción, más que por convicción.

Esta situación da cuenta de una problemática sumamente compleja que se encuentra relacionada con el limitado uso de servicios de salud del IMSS e ISSSTE y con la deficiente calidad de los servicios que prestan los centros de salud dirigidos a población abierta. La atención en salud, desde la perspectiva de los determinantes sociales de la salud, es un determinante intermedio en los resultados, que a su vez se vinculan con la respuesta del sistema a las necesidades de la población.

La aparente predisposición a pagar por servicios de salud privados nos orienta sobre el riesgo al que están expuestos particularmente aquellos grupos que viven en contextos de pobreza generalizada, como la región de la Mixteca baja, en donde la inequidad se traduce en mayor gasto de bolsillo para cubrir las necesidades de atención en salud.

De acuerdo con el reporte de la Comisión de Determinantes Sociales de la Salud de la OMS,[1] las políticas actuales en muchos países se basan casi exclusivamente en modelos de crecimiento urbano, olvidando las necesidades de infraestructura y servicios en zonas rurales. Esto tiende a desencadenar y promover la emigración hacia centros urbanos nacionales y hacia otros países. En el caso de México, la emigración hacia EU en zonas marginadas como la Mixteca baja se ha institucionalizado y representa una opción trascendental de sobrevivencia para sus pobladores.

El reto que claramente puede ser identificado en este escenario son las barreras culturales (incluidas las relacionadas con el lenguaje), sociales y económicas que enfrentan los pobladores de la Mixteca baja para la utilización de servicios de salud. Así, la pregunta central debe ser planteada en torno al *cómo* diseñar, abordar, llevar, promover y evaluar servicios de salud de calidad a los pobladores de las localidades más remotas y empobrecidas. En este ámbito, resulta esencial continuar el trabajo iniciado en la tercera generación de reformas al sistema nacional de salud que tiene como propósito la implementación de una cobertura universal en salud que incorpore equidad, calidad y protección financiera.[24]

Es evidente que estas metas tienen implicaciones que van más allá de la salud; son temas de justicia social que deben ser atendidos de manera prioritaria, estratégica, sostenida y coordinada junto con otros sectores. Es necesario que los desafíos que actualmente enfrenta el sistema de salud en torno a la migración y la pobreza sean no únicamente identificados, sino investigados a profundidad para determinar su magnitud y actuar en consecuencia.

Ésta, como todas las investigaciones sociales, tiene limitaciones. Una de ellas es que este estudio, al ser transversal, no nos permitió identificar si los mayores recursos personales y materiales en los HogMig ya existían y fueron los factores que de alguna manera promovieron la migración de sus miembros, o si el mejoramiento de sus condiciones personales y materiales ocurrió como consecuencia de la migración. Esta última noción parecería ser la respuesta más adecuada, ya que la razón fundamental para emigrar a EU, de acuerdo con la mayoría de los participantes en el estudio, fue mejorar la economía familiar. Otra limitación del diseño fue que no permitió medir el impacto gradual de las remesas recibidas en los HogMig sobre la utilización de servicios de salud. Finalmente, es posible que estos resultados reflejen un ses afiliación al Seguro Popular en la región.

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The cervical cancer screening program in Mexico: problems with access and coverage*

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Introduction

In Mexico, a program for early detection of cervical cancer has existed for more than 20 years. This program aims to offer a yearly Papanicolaou (Pap) smear to all women under 65 years old with an active sexual life. Despite existing infrastructure and resources, the mortality rate has remained constant and incidence of invasive cervical cancer is one of the highest in the world, with an estimated annual age-adjusted rate of 40.1/100,000 in 1985.1 Despite this evidence of lack of efficacy, the program has not been evaluated until now.

In Mexico, the number of deaths due to cervical cancer reported between 1980 and 1995 was estimated at close to 62,000 cases.[2,3] In 1992, it was the highest recorded mortality rate for cervical cancer in the world, at 14.7 age-adjusted to the world standard population.[4] In Mexico City, invasive cervical cancer represents 60 percent of the cases diagnosed with the Pap test; at this stage in the disease, the benefits of this type of diagnosis are minimal.[5]

A broad evaluation study aimed at identifying the most relevant reasons for the failure of the screening program to reduce cervical cancer mortality is now underway. This study includes analysis of reproducibility and validity of cytological diagnosis,[6,7] quality evaluation of protocol procedures and follow-up,[8] and estimation of screening coverage of the population in Mexico, which is extremely low, between 10 and 15 percent for the 35 to 64 year age group.[9,10]

In this article, we present results from a cross-sectional study conducted in two regions of Mexico (Mexico City and Oaxaca) to identify determinants of women's participation in the cervical cancer screening program (CCSP) as a measure of coverage.

Materials and methods

A cross-sectional study was carried out in 1994, based on a random sample of women aged 15 to 49 years who had lived for at least one year in Mexico City or in the Costa Chica and Tehuantepec Isthmus regions of the southern state of Oaxaca. These areas represent the two extremes in the national distribution of Gross Internal Product, Mexico City being the highest and Oaxaca the lowest. The study population base was identified using the national household-sample frame of the Mexican General Direc-

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torate of Epidemiology. Two random samples (without replacement) were obtained, one of 2,000 households in Mexico City and another of 3,700 in Oaxaca. Interviewers collected information via questionnaire about the quality of the housing structure (construction material, potable water availability, indoor plumbing availability, number of inhabitants per room), and the gender, age, and duration of residence for all residents in the sampled households. Eligible women (aged 15 to 49) who had an active sexual life (1,435 in Mexico City and 2,773 in Oaxaca) were invited to complete an additional questionnaire.

This questionnaire provided information on individual socioeconomic variables (years of education, occupation of the head of the family and of the woman, and income), on gynecologic and reproductive history, on use of the Pap test, and on the woman's level of knowledge about the test and the screening program.

The first question in the section of the survey on CCSP was, 'do you know what a Papanicolaou (test) is? Women who responded affirmatively were then asked to describe what the Pap test is used for. Interviewers were trained to provide standardized multiple-choice responses to these questions, and, after the questionnaire had been completed, to explain to the women that the Pap test is used to detect cervical cancer and to describe the procedure.

Therefore, bias due to misclassification is unlikely; if any, it would have been randomly distributed among the women in the study.[10]

In this study, we decided to include women between 15 and 49 years of age for the following reasons: (i) to form a group of-women-of reproductive age; (ii) in Mexico, cervical cancer cases are observed after age 20 years and reach the highest frequency between ages 35 and 44;[2-3] (iii) with the results obtained, interventions can be planned that contribute to diminishing mortality due to cervical cancer in the medium term.

The quality of housing variables were combined to form an index with three categorical levels (bad, regular, or good housing quality).[11] To assess the effect of known risk factors for cervical cancer on the demand for the Pap test, we constructed an index representing reproductive risk. The main reproductive variables which were found to be associated significantly with cervical cancer risk in a previous study[8,9,12] were considered first separately and then summed into one continuous variable representing reproductive risk.

In the construction of this index, we used the following variables: number of vaginal deliveries (from zero to 10+); age at first intercourse (from under 15 to 24+); number of lifetime sexual partners (from one to 10+); age (in five-year categories). In a second step, the prevalence of women who ever had a Pap test was evaluated according to the quintile distribution of the reproductive risk index (RRI). Logistic regression models then were applied to estimate the association between use of the Pap test and demographic, socioeconomic, and reproductive variables using bivariate and multivariate models. The models were applied using SPSS software.[13] The measure of association was the odds ratio (OR) as an estimate of relative risk.

To test for statistical significance, 95 percent confidence intervals (CI) were also estimated. The final model integrated the variables with a significant association, including the RRI (because these variables were the main reproductive risk factors for cervical cancer in Mexican women in previous studies).[8,9]

Results

Among the selected households, 93 percent in Mexico City and 99 percent in Oaxaca State were successfully identified and assessed. Participation rates were high: in Mexico City, 99.3 percent (n = 1,435) and in Oaxaca, 97.6 percent (n = 2,773) agreed to be interviewed. In Table 1, basic information on demographic, socioeconomic, and reproductive characteristics of the two samples is reported. Mean age was similar in both places. Years of education and number of Pap tests were higher in women from Mexico City.

Knowledge of what the Pap test is used for strongly predisposed to the use of the early cervical cancer detection program in Mexico City (OR = 31.7, CI = 18.6-54.1) and in Oaxaca state (OR = 61.5, CI = 42.0-89.9). As education level increases, the probability of use of the Pap test increases. Women with an education equal to or greater than the undergraduate university level reported a 3.6 times greater probability of having undergone the test in Mexico City (CI = 1.5-8.8) and 5.3 times greater in Oaxaca state (CI = 2.8-10.0), compared with those who were illiterate (Table 2). Women with access to social security healthcare reported more frequent use of the Pap test compared with women without access, both in Mexico City (OR = 1.7, CI = 1.4-2.2) and in Oaxaca (OR = 2.2, CI = 1.8-2.7) (Table 2).

When a history of use of the Pap test was considered, 64.2 percent of women from Mexico City reported having had at least one Pap test during their lifetime, while this

Table 1. mean age of women, education level, reproductive risk factors, use of Papanicolaou test and mean age at the first Pap test in Mexico City and Oaxaca samples

Variables	Mexico City		Oaxaca State	
	Mean	SD[a]	Mean	SD[a]
Age	33	8.5	32.3	8.7
Education level	7.3	1.1	3.4	0.9
Menarche	12.7	1.5	13.5	1.4
Pregnancies	2.5	1.9	3.9	2.7
Normal births	1.7	1.9	3.4	2.7
Cesarean section	0.4	0.8	0.2	0.5
Abortions	0.2	0.6	0.2	0.5
Age at first intercourse	20	4.1	18.1	3.5
Age at first birth	21	4.7	19	3.7
Number of sexual partners	1.2	0.9	1.2	0.8
Number of Pap tests	3.4	5.3	1	2.4
Age at first Pap test	27.9	7.6	29.7	8.6
Reproductive risk index	13.5	4.4	16.5	5.2

[a]SD= standar daviation

proportion was 30 percent in women residing in Oaxaca. Among those who had undergone the test at least once, over 75 percent in both areas had their last Pap test during the year before the interview. When women were asked what the Pap test is used for, 79.7 percent in Mexico City compared with 40.5 percent in Oaxaca correctly reported that the test is used to detect cervical cancer. In the sample as a whole, 97 percent of the women who did not know what the Pap test is used for had never undergone a Pap test (Figure 1).

Among women who have had a Pap test at least once, in Mexico City, increasing risk of cervical cancer corresponds to an increase in the rate of use of the Pap test. However, in Oaxaca, the higher the quintile of risk, the lower the use of the Pap test (Figure 2). In fact, the RRI was associated positively with Pap screening in Mexico City but was associated inversely with screening in Oaxaca State. In sum, the main factors which predicted use of the Pap test in the sample of Mexican women studied were: knowledge of what the Pap test is used for; education level; socioeconomic level; and access to social security healthcare. The rate of Pap test use in the urban area studied (Mexico City), was major compared with the rural region (Oaxaca), with an estimated OR of 1.6 (CI = 1.4-1.9) in a multivariate logistic regression model adjusted for the principal variables which predict use of the Pap test.

Discussion

The low efficacy in developing countries of early detection programs for cervical cancer based on the Pap test has been encountered repeatedly.[14] The failure of these programs has been attributed to several factors, among which is low level of coverage.[15] In the Mexican program, which has existed for over 20 years, the problems are multifactorial, and need urgent attention. The low effectiveness of the early cervical cancer detection in Mexico is due principally to factors associated with service quality and coverage. Quality of Pap collection is deficient; in our study, 64 percent of a random sample of specimens lacked endocervical cells.[7] In terms of the diagnostic precision of the Pap,[6,18] reading centers presented overall false-negative indices between 10 and 54 percent. Women seek cancer detection services late (55 percent of women affected seek care because they have symptoms).[12] In addition, the national cervical cancer detection in Mexico, which requires annual testing, only has

Table 2. Determinants of participation in the cervical cancer early-detection program in Mexico[a]

	Mexico City				Oaxaca State			
	Users	**Nonusers**	**Or[b]**	**(CI)[c]**	**Users**	**Nonusers**	**Or[b]**	**(CI)[c]**
Knowledge of what the Papanicolaou test is used for								
No	17	193	1.0	—	26	930	1.0	—
Yes	905	293	31.7	(18.6-54.1)	798	1,011	61.5	(42.0-89-9)
Missing data	0	0	—	—	8	0	—	—
Education (yrs)								
None	15	15	1.0	—	87	533	1.0	—
< 3	35	24	1.4	(0.5-3.7)	80	224	1.9	(1.3-2.8)
3-6	212	123	2.1	(0.9-4.7)	330	782	2.3	(1.7-3.1)
7-9	303	178	2.4	(1.0-5.5)	185	258	2.9	(2.0-4.2)
10-12	187	87	2.8	(1.2-6.7)	97	83	3.2	(2.1-5.1)
> 12	164	59	3.6	(1.5-8.8)	44	20	5.3	(2.8-10.0)
Missing data	6	27			9	41		
χ^2 for trend	11.4	P < 0.001					192.1	P < 0.001
Socioeconomic level								
Low	7	13	1.0	—	211	1,159	1.0	—
Medium	138	97	2.7	(1.0-7.2)	280	474	2.4	(1.9-3.0)
High	766	376	2.9	(1.1-7.6)	338	258	4.1	(3.1-5.3)
Missing data	11	27	—	—	3	50		
χ^2 for trend	12.4	P < 0.001				355.8 P	< 0.001	
Access to social security healthcare								
Without social security	325	256	1.0	—	462	1,609	1.0	—
With social security	592	239	1.7	(1.4-2.0)	369	308	2.2	(1.8-2.7)
Missing data	5	18			1	24		

[a] Model adjusted for all variables in the table and reproductive risk index.
[b] OR = odds ratio.
[c] CI = 95% confidence interval.

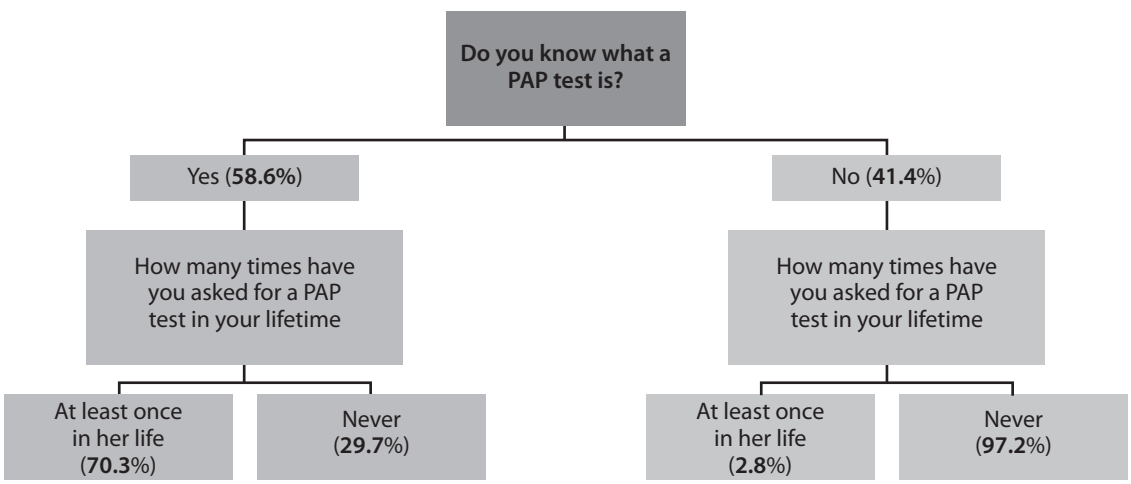

Figure 1. Knowledge of what the Pap smear test is and participation in the cervical cancer detection program

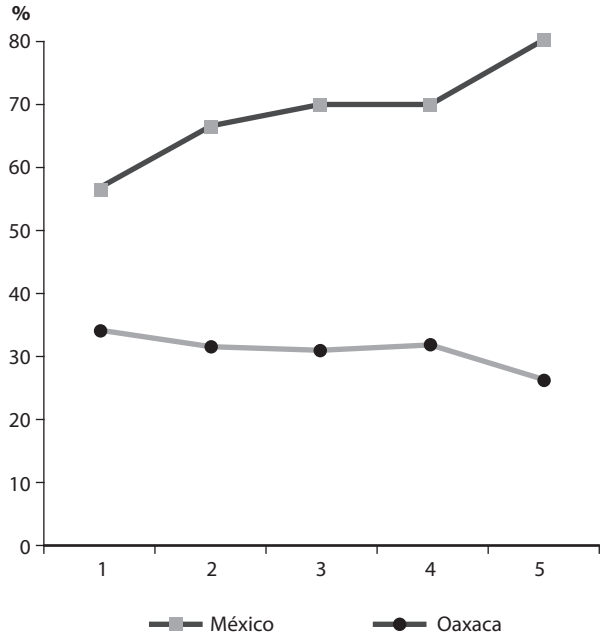

Figure 2. Prevalence per 100 women of use of the Pap test in Mexico City state, by quintiles of reproductive risk index

infrastructure and resources for carrying out 3,516,000 Pap tests for an estimated population in 1996 of 16,507,011 women between 25 and 65 years of age.

Low coverage is often associated with protocols in use, which recommend excessively short intervals between Pap smears.[16] In general, it is suspected that these programs tend to exclude high risk women, while they apply extremely frequent diagnostic procedures mainly to those women who are at lower risk. Despite these problems, a case-control study carried out in Mexico which sought to evaluate the effect of the Pap smear in asymptomatic women still found evidence of a small significant protective effect of exposure to the test, even after adjustment for socioeconomic and other variables.[12] This suggests that low-quality smears and cytodiagnosis are insufficient as explanations of the lack of positive impact of the program on the population. In Mexico, the crucial factor may be accessibility, especially with reference to high risk women.

In the Mexican population, two main groups of determinants of cervical cancer, low socioeconomic class and reproductive risk factors, have been identified in a previous case-control study.[8,9] In the cross-sectional population-based study presented here, the association of these variables with participation in the program has been explored. Descriptive results related to the variables under study in the two population samples confirm the differences between the two residential areas chosen on the basis of extreme Gross Internal Product values. In general, the proportion of low socioeconomic class and of reproductive risk factors is higher in the less affluent rural region compared with the urban area. In both areas, however, there is a significant proportion of women at a low socioeconomic level, who are at high reproductive risk and are nonusers of the program. In Mexico City, 35.8 percent of women, and in Oaxaca, 70 percent reported never having received a Pap smear; 20.3 percent and 59.5 percent, respectively, were not correctly informed about what this test is used to detect. These data confirm that low coverage represents a major problem of the program in this population.

When sociodemographic variables and educational level were tested as predictors of participation in the program, it was clear that these indicators, which have been shown to be associated positively with cervical cancer risk, were also strongly negatively associated with use of the Pap test. Specifically, a very low prevalence of Pap test use in women with high risk of cervical cancer was found in the rural area. Among women who were in the highest risk category for cervical cancer, the overall prevalence of exposure to the Pap test was 26 percent. The multivariate analysis of socioeconomic level, education level, access to social security healthcare, and knowledge of what the Pap test is used for, provides evidence of the independent role of these factors in predicting participation. Low socioeconomic level has been associated with low use of medical services in several studies,[17] and specifically of cancer screening.[18,19]

In the United States, this has been confirmed in some ethnic communities,[20-22] including among women of Hispanic origin.[23,24] In some studies, these minorities have been identified as being at higher risk for cervical cancer.[25] Low education level has been identified specifically as a predictor of low use in certain studies, even when the general level of coverage in the population is high.[26]

Several studies have pointed out that nonparticipants in the program are more often high risk women,[27,28] particularly in rural areas, as was observed in our study in Mexico. In relation to this, absence of a history of Pap testing is the objective characteristic useful for describing the target population of a CCSP. Reasons for women's nonattendance for cervical screening have been studied extensively.

These include the fear of pain in English women,[29] and the embarrassment, particularly when the test is car-

ried out by a male doctor.[30] Inadequate administration and language are potential barriers to screening uptake in different ethnic groups in London.[31] Deschamps et al [32] have shown in native Indian Women of British Columbia, the reasons for not participating in the CCSP were due mainly to the lack of knowledge about the Pap test and about its importance, feelings of embarrassment and shame, and lack of continuity of care due to the high turnover of physicians in the native communities.

In Mexico, qualitative research on this topic shows that in never-users, the lack of knowledge about the Pap is the principal barrier. In ex-users of the Pap test, a female sample collector is preferred. The presence of a man or men inhibits the women and makes the test an experience which she often interprets as shameful. In terms of medical care, public services are perceived as impersonal. One of the principal barriers to seeking Pap testing is the long waiting period (sometimes over six months) required in public services to receive the test results. Some of the women interviewed perceived cancer and death as synonymous. In rural areas, many users did not seek testing because their sexual partner would not allow it.[33]

The quality of follow-up of treatment of diagnosed lesions in Mexico, which has not been evaluated thus far, also may partially explain the low quality of CCSP. A high number of women who underwent the test never received their results, including an important proportion of subjects affected by in situ and invasive cancers.[12] In addition, there is a lack of systematic evaluation of the screening programs in general.

Strategies for involving high risk women in screening programs have been proposed by some authors.[34] In a qualitative study in London (United Kingdom), a program was able to involve women from ethnic minorities when they were motivated through bilingual focusgroups.[35] Other strategies involve population-based educational programs, educational programs for technical workers in the screening program, or a combination of the two.[36] In a program specifically aimed at increased participation of women of Hispanic origin in the US, an intervention promoting social networks was found to beeffective.[37] In Thailand, where 19 percent coverage has been estimated for use of the Pap test by the general population, the use of mobile testing units offering the procedure was shown to be effective, with an increase incompliance up to 58 percent.[38] Further, a call-recall invitation system was effective in significantly increasing participation of women in low socioeconomic levels in the UK.[39]

Several studies suggest that to achieve cost-effectiveness, CCSPs should promote compliance by women who have never participated in the program and encourage those who do seek the test to do so no more than once every three years, or even every five years. The relevance of this type of strategy also is suggested by the projections of spontaneous time trends of cervical cancer in the absence of screening which, in some estimates, imply a significant increase of the expected frequency of the disease in the future.[40]

In the present study, low compliance is confirmed as a major problem of the national cervical-cancer early detection program in Mexico, especially because it is not concentrated among high risk women. Strategies for increasing the effectiveness of the program therefore should focus on increasing participation, in part through changes in the national protocol which recommends a one-year interval for the Pap test, in order to concentrate resources on a specific high-risk target population. In the Mexican context, this target population includes women residing in low-income areas, with low education levels, who live in low-quality housing structures, and with a history of high reproductive risk, including a large number of children, unstable partners, and early age at first intercourse.

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We appreciate the contributions of the following people: Dr. Miguel Angel Lezana Fernandez, Director of the Directorate of Informatics, Statistics and Evaluation, Ministry of Health; Dr. Oscar Herrera Tellez (now deceased), former Director of Public Health Services, Ministry of Health, Mexico City; the Ministry of Health authorities in the state of Oaxaca; Dr. Jorge Saavedra, former research director of the PASPA-Solidaridad program (World Bank); Aurora Franco for her work on the coordination of the operational field work; and Teresita Ramirez and Oscar Mendez, for their participation in the study.

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How people respond to illness in Mexico: self-care or medical care?*

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Introduction

People respond to illness in diverse modalities. The modality that is finally chosen and adopted depends both on cultural and socioeconomic factors and on the perception of the illness.[1] In general, the ways of responding to illnesses can be grouped into three large categories: those related to seeking attention among specialised agents, medical professionals and paramedics (medical care); those provided by the sick individuals themselves or by their closest social and family network (self-care); and healers, midwives and herbalist, among others (lay care).

Previous studies have demonstrated that most of the signs and symptoms of an illness perceived or identified by the population are attended or treated by the ill people themselves or by a member of their social support network and not by doctors or other providers of medical care. This is contrary to what medical institutions generally believe. [2] Factors that may encourage the use of various forms of self-care include problems with access to and availability of medical care, depersonalised medical attention, the increase in technological costs, increasing knowledge among the population of how to deal with medication, and recognition of the limits to healing that medical care can produce.[3,4]

Self-care cannot be considered, only as a reaction to the dysfunctional effects of contemporary medical systems or as a new and increasing social phenomenon since it has been, both nowadays and in the past, a basic health-related behaviour in different societies.[3]. The prevalence of self-care as the main way of responding to illness in developing countries, particularly among highly marginalised social groups, could well be another indicator of social inequity, expressing a lack of access to certain social benefits, particularly medical care during an illness. Timely access to appropriate health care can reduce the duration and seriousness of illness while at the same time reducing complications and mortality rates. This can be particularly important in children less than 5 years old with infectious diseases (acute respiratory disease and diarrhoea), which are clearly serious and therefore require medical attention. [5] Residents in rural and poor areas where these types of problems are the most frequent causes of illness and mortality in this age group face socioeconomic and cultural barriers that prevent them from using medical services despite the fact that family members realise that self-care is not sufficient to resolve their problem.

In the case of chronic diseases such as diabetes and its complications, appropriate medical care combined

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with self-care could reduce the number of hospital stays. However, given the chronic nature of their illness, many patients undergo inadequate self-care. The measures they seek include inadequate dosage, self-medication for complications, and use of herbs and other substances that lack therapeutic value. Inadequate self-care leads many patients to present complications in the early stages of disease.[6] Under these conditions self-care becomes a problem with respect to controlling chronic illness.

The conditioning factors of the process through which attention is paid to disease in certain segments of the population in urban[7] and rural areas[8] have already been investigated. The relationship between socioeconomic conditions and illness as factors that may influence the medical care or self-care option in various population groups in Mexico has, nevertheless, barely been studied. This paper aims to analyse the relation between socioeconomic, demographic and illness factors, and forms of responding (self-care or medical care) to illness in Mexico, based on data from the 1994 National Health Survey.

The Mexican health care system

To understand the context where illness is attended, it is important to know how the health care system is organised in Mexico. On the one hand, we find various Social Security institutions that provide coverage to the majority of labourers in industry, banks, commerce and government. This system includes ambulatory care and hospital services, as well as medicines and lab tests that are prepaid through contribution s from workers, their employers and the government. According to results from the 1994 National Health Survey,[9] coverage is estimated at 40.5% of the Mexican population. On the other hand, Social Assistant Institutions offer medical services to the uninsured, mostly in poor areas, in the periphery of major urban centres and rural areas, and covers 59.5% of the population. These institutions only offer primary health care (medical assistance and vaccines, excluding drugs) without pocket purchase and, in cases of hospitalisation, patients must pay for all services. The segment of the population with the least economic resources must therefore pay for most, if not all, of their health services, medicine, and all the procedures that doctors consider necessary for their care. Finally, 2.4% of the population reported having private medical insurance, paid by them or their employer. Under these conditions, the population decides the type of health care they will seek in order to resolve their health problems.

Materials and methods

The National Health Survey included 64000 individuals with statistical representation in five regions of Mexico.* Our analysis only included individuals reporting a health problem in the 2 weeks preceding the poll: 5460 people representing 9% of the studied population. The identifying question on health problems was: "In the last two weeks has anybody in the household experienced some sort of health problem (symptoms, sickness, illness or accidents)?" Based on a previous evaluation of demographic, socio-economic, health care and illness data from the survey,[9] the following variables were selected for this study: form of attention, type of illness, treatment received, reasons for opting for self-care or medical care, and sociodemographic factors.

The form of attention (self-care or medical care) was considered a dependent variable. For this study, self-care includes care provided by the person suffering some aliment or by a member of him/her family, a friend, or a neighbour. The individuals attended by doctors, nurse s or dentists were included in the category of medical care. The type of treatment received (none, remedies, drugs or both) was analysed according to the form of attention.

Six groups of health problems were selected for study and grouped according to the International Disease Classification (IDC, 9a. Ed.), altogether representing 50.4% of the total problems reported: intestinal illnesses (IDC, 1-9), acute infections of the breathing system (IDC, 460-487), diabetes mellitus (IDC, 250), essential arterial hypertension (IDC, 401), diseases related to the skeletal muscular system and to the connective tissue (IDC, 710-739), and general symptoms (IDC, 780).

The remaining health problems included a variety of signs, symptoms, illnesses and ill-defined problems whose percentage weight is below 2% each and, which, taken as a whole, represent 49.6% of the total; they were therefore not considered in the analysis in of their relationship to form of care. The reasons for opting for self-care were only analysed in relation to the perception of the seriousness of the illness.

* Northern region: Baja California; Baja California Sur; Sonora; Chihuahua; Sinaloa; Nuevo León; Tamaulipas; Durango and Zacatecas. Central región: San Luis Potosí; Guanajuato; Querétaro; Michoacán; México; Tlaxcala; Nayarit; Aguascalientes; Jalisco y Colima. Southeast región: Morelos; Puebla; Veracruz; Campeche; Tabasco; Yucatán y Qunitana-Roo. Mexico City and Metropolitan Area. PASSPA region: Hidalgo; Oaxaca; Guerrero and Chiapas (the poorest areas of Mexico).

In order to identify factors associated with the form of attending illnesses (self-care or medical care), a logistic regression model was developed with the factors of age, sex, indigenous languages spoken, access to Social Security and private medical insurance, perception of the seriousness of the illness (slight, regular, serious), place of residence (rural-urban areas), and socioeconomic region (North, Centre, South/East, Mexico City and Metropolitan Area, and PASSPA. This last region includes the states with the highest poverty levels in Mexico).

Results

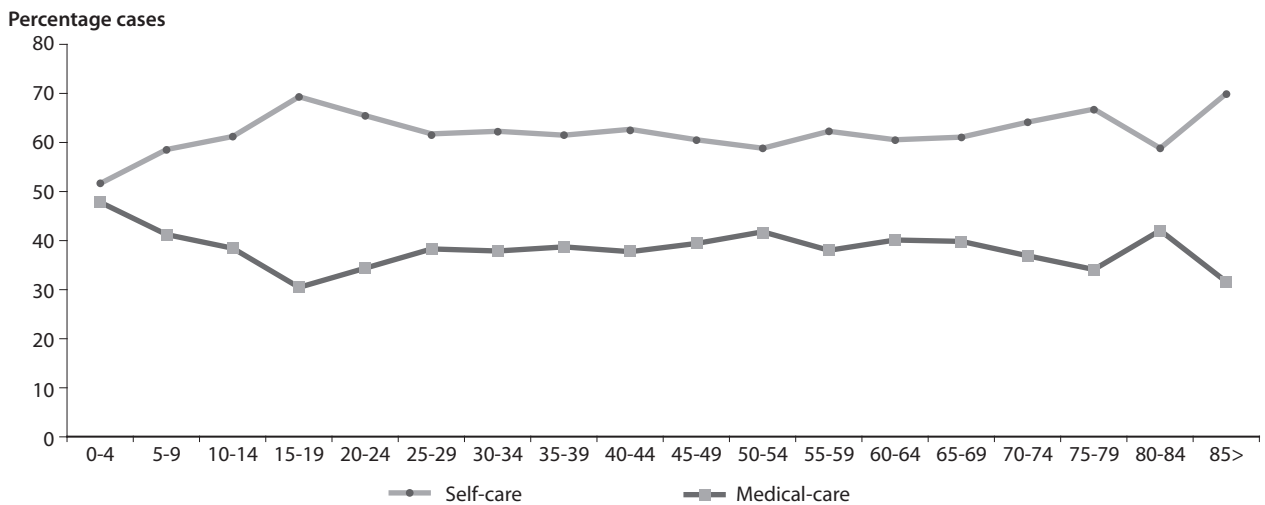
Of the total population studied, 61 % was self-attended and only 39% used medical care. Those attended by medical services more frequently than any other age group were children under 5 years of age (Fig. 1).

Demographic and socioeconomics factors, and perception of the seriousness of the illness according to form of attention are presented in Table 1. Type of treatment varied according to the form of attention sought. The percentage of the population that did not take any drugs or remedies was greater among those who opted for self-care (26%) than among those receiving medical care (6%). Among those who attended themselves, 31% received remedies (this percentage comes from adding those who took only remedies and those who took remedies as well as some drug) and 58% used drugs (the addition of those taking drugs together with some other remedy and those using only drugs). Of the ill people receiving medical care, 92% were prescribed medicine (the addition of those using medication plus those who used both remedies and drugs). One out of every five of this group was prescribed remedies and medication simultaneously (Table 2).

The reasons *why* people did not look for medical care varied according to the degree of seriousness of illness perceived. Fifty-two percent of those who self-assessed their health problem as serious did not use medical care because they considered it too expensive or they could not afford it. Seventy percent of those who self-assessed their health problem as slight did not use medical care because they considered it unnecessary (Table 3).

Self-care prevailed in dealing with ailments of the skeletal muscular system and of the conjunctive tissue (78%), general symptoms (68%) and acute infections of the breathing system (67%). Although medical care prevailed among the cases of diabetes and essential arterial hypertension, a high percentage of ill people prescribed their own treatment (42 and 44%, respectively). Intestinal infectious diseases accounted for similar self-care and medical care percentages (Fig. 2).

The logistic regression model showed a greater frequency of self-care in ill people over 5 years of age, male, with an illness perceived as slight, without social security or private health insurance, and living in poor regions and rural areas (Table 4).



Source: National Health Survey. Mexico, 1994

Figure 1. Form of attention to illness according to age groups

Table 1. Demographic, socioeconomic factors and perception of the seriousness of the illness according to form of attention[a]

Factors	Form of attention					
	Medical-care		Self-care		Total	
Age groups	**N**	**%**	**N**	**%**	**N**	**%**
0-4	354	16.5	389	11.7	743	13.6
5-14	330	15.4	491	14.8	821	15.0
15-49	888	41.4	1529	46.1	2417	44.2
50-64	338	15.8	513	15.5	851	15.6
65 and over	234	10.9	398	12.0	632	11.6
Total	2144	100.0	3320	100.0	5464	100.0
Sex						
Women	891	41.6	1482	44.6	2373	43.4
Men	1253	58.4	1838	55.4	3091	56.6
Total	2144	100	3320	100.0	5464	100.0
Social Security access						
Yes	1132	52.8	1070	32.2	2202	40.3
No	1010	47.2	2248	67.8	3258	59.7
Total	2142	100.0	3318	100.0	5460	100.0
Private medical insurance						
Yes	71	3.3	46	1.4	117	2.2
No	2060	96.7	3291	98.6	5305	97.8
Total	2131	100.0	3337	100.0	5422	100.0
Perception of the seriousness of the illness						
Slight	666	31.2	1277	38.7	1943	35.7
Moderate	978	45.8	1423	43.1	2401	44.1
Severe	493	23.1	604	18.3	1097	20.2
Total	2137	100.0	3304	100.0	5441	100.0
Socioeconomic region						
Northern	540	25.2	721	21.7	1261	23.1
Centre	455	21.2	797	24.0	1252	22.9
Mexico City and Metropolitan Area	385	18.0	431	13.0	816	14.9
PASSPA (High index of poverty areas)	313	14.6	737	22.2	1050	19.2
South/East	451	21.0	634	19.1	1085	19.9
Total	2144	100.0	3320	100.0	5464	100.0
Area of residence						
Urban	1571	73.3	2001	60.3	3572	65.4
Rural	573	26.7	1319	39.7	1892	34.6
Total	2144	100	3320	100	5464	100

[a] Sourse: National Health Survey, Mexico, 1994.

Table 2. Form of attention and treatment received by those reporting sick ness in the last two weeks before the survey[a]

Treatment received	Form of attention			
	Self-care (60.7%)		Medical care (39.3%)	
	N	(%)	N	(%)
Nothing	857	25.8	126	5.8
Remedies	535	16.1	37	1.7
Drugs	1367	41.2	1585	73.9
Remedies+drugs	557	16.8	399	18.6
Total	3316	100	2147	100

[a] Sourse: National Health Survey, Mexico, 1994.

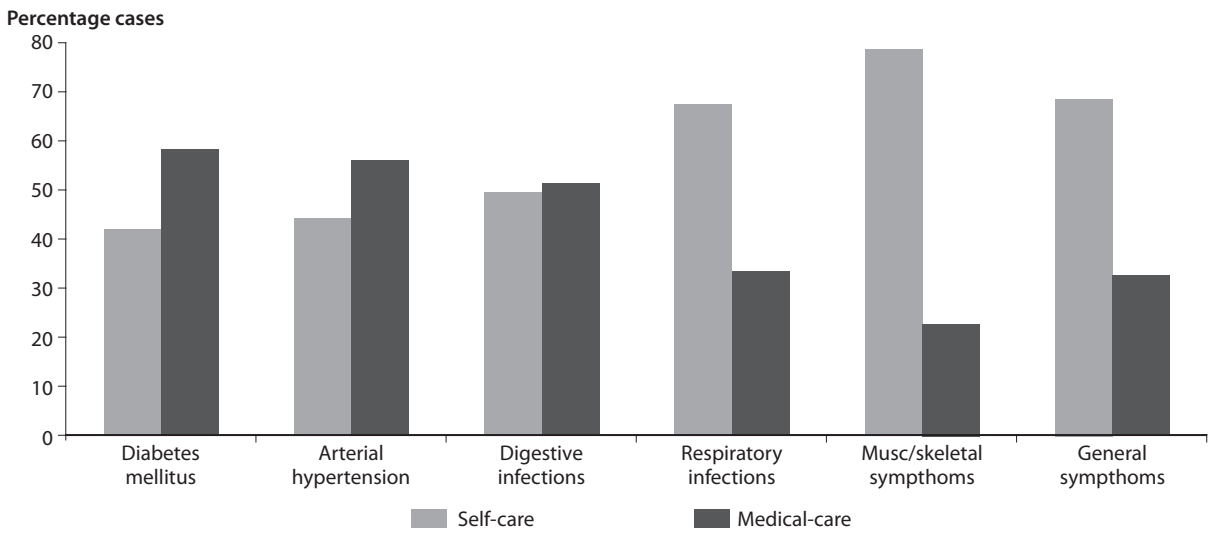
Discussion and conclusions

In Mexico, as in most Latin American countries, self-care with the use of remedies and other healing modalities has historically been one of the most important forms of responding to illness.[10] Although the availability of both public and private medical care has increased in the different regions of Mexico within the last 50 years, it has been markedly unequal.[11] Different forms of health care now coexist, forming a pluralistic model. On the one hand, practitioners of traditional medicine (herbalists, healers and midwives, among others) have adopted and adapted the use of certain drugs to take care of illness, while -as

Table 3. Reasons why people did not seek medical care according to the perceived seriousness of the illness[a]

Reasons for not seeking medical care	Perceived seriousness of the illness					
	Slight		Regular		Severe	
	N	(%)	N	(%)	N	(%)
Did not consider it necessary	815	(70.2)	(653)	(53.3)	165	(3.5)
No medical service was available	43	(3.7)	56	(4.5)	22	(4.4)
Too expensive/had no money	250	(21.5)	445	(36.6)	255	(51.8)
Distrust/bad experience with doctors	41	(3.5)	40	(3.2)	38	(7.7)
Rejected by the medical service	11	(0.9)	30	(2.4)	12	(2.4)
Total	1160	(100)	1224	(100)	492	(100)

[a] Sourse: National Health Survey, Mexico, 1994.



Source: National Health Survey. Mexico, 1994

Figure 2. Form of attention to selected illness in Mexico.

has been observed in this and other studies -allopathic medicine has incorporated some traditional healing resources, such as herbal remedies, into its practice.[1]

The data analysed in this investigation show a clear prevalence of self-care in Mexico associated with demographic and socioeconomic factors as well as with the Table 3 perceived seriousness of the illness. In 1994, certain authors pointed to the 1ack of drugs and other material resources for medical health care in public health institutions, particu1arly those attending the poor and people without Social Security benefits.[12] This is an additional factor to take into account in order to understand *why* people did not look for medical care, particularly in rural and poor areas.

Table 4. Factors associated with self-care with multivariate model by logistic regression

Factors	Odds ratio	P-value	Confidence interval (95%)
Age groups			
0-4a	1.00		
5-14	1.41	0.001	1.14-1.74
15-49	1.79	0.000	1.50-2.13
50-64	1.65	0.000	1.33-2.03
65 and over	1.85	0.000	1.47-2.32
Sex			
Female[a]	1.00		
Men	1.16	0.009	1.03-1.30
Social Security access			
Yes[a]	1.00		
No	2.12	0.000	1.87-2.40
Private medical insurance			
Yes[a]	1.00		
No	1.91	0.001	1.29-2.81
Perception of the seriousness of the illness			
Severe[a]	1.00		
Moderate	1.33	0.000	1.14-1.54
Slight	1.90	0.000	1.62-2.24
Socioeconomic region			
PASSPA (High index of poverty areas)a	1.00		
Northern	0.75	0.002	0.62-0.90
Centre	0.89	0.233	0.74-1.07
Mexico City and Metropolitan Area	0.69	0.001	0.56-0.86
South/East	0.67	0.000	0.56-0.81
Area of residence			
Urbana	1.00		
Rural	1.31	0.000	1.14-1.51

[a] Reference category. Pseudo R2 = 0.0537. Source: National Health Survey, Mexico, 1994.

Another element that must be considered in the case of Mexico is the payment of complementary services in clinics and hospitals. Although most primary health care services in public institutions are "free of charge" (that is, without a direct payment for the medica1 service rendered) the users have to pay certain fees that health care officers consider symbolic and that are meant to "regu1ate the demand". For those in extreme poverty, however, these fees, without representing a significant income for the institutions, have become an additional economic obstacle to receiving medical care.[13] It has been shown that groups of low-income ill people seldom use medical care in spite of the seriousness of the disease.[14]

Additionally, the socioeconomic conditions of most of the population worsened towards the end of 1994 as the economic crisis deepened. It is estimated that between 1994 and 1996, another 14.7 million Mexicans joined the ranks of extreme poverty, thus reaching a total of 50.9 millions, 55% of the total population.[15]

This analysis shows that self-care prevailed among the population living in poor regions and rural areas. It also found that half of those who perceived their health problem as serious opted for self-care and did not look for medical care since they considered medical services to be far too expensive or they could not afford them. For this social group, self-care does not represent a freely chosen personal option, nor is it only a cultural issue. Rather it is an indicator of social inequity in health, revea1ing the unequal access to medical care in Mexico.

Although most of those who opted for self-care evaluated their health problem as slight, the way illness is evaluated must be seen in the specific social context, in which the perception of a disease's seriousness varies according to its "normality". In other words, people evaluate and respond to the same symptoms differently depending on their socio-economic characteristics. Among the extreme poverty groups, certain diseases (such as cough, pain, diarrhoea and other general symptoms) have become part of everyday life and of their "normal" health condition and therefore are not considered a question of importance deserving medical care.[16]

Many of these illnesses could at least hypothetically be treated adequately with remedies or drugs sold over the counter (OTC). Although over half the self-care cases used drugs, it was not possible to analyse either the type or amount of medication used since the National Health Survey did not collect these data.

Community studies, however, have found that the population uses a wide variety of drugs without any medical prescription. Many drugs not included as OTC drugs are in fact sold over the counter and, even worse, many of them are unsafe or obsolete.[17,18]

Most medical evaluations regarding self-care mainly refer to the potential risks involved in using inadequate, unsafe or high risk drugs to treat illness, using or taking inappropriate dosages, incomplete treatments and delays in diagnosing health problems.[19] From this point of view, self-care represents a risk rather than a benefit. Other evaluations, however, suppose self-care, including self-medication, to be positive. Self-medication is considered an act of independence against the ownership and control of medical knowledge and technology by doctors. This, however, does not take into account the negative effects that self-prescription of drugs might have.[20] Although for some health problems, self-care might be an appropriate response, the particular conditions in which this process takes place must be analysed in order to understand its many consequences.

In the case of the chronic problems analysed (diabetes and hypertension), although medical care prevailed, an important proportion of sick people opted for self-care. Are they thus substituting, complementing or simply reproducing medical prescriptions? Sorne chronic patients have learned to control their disease the same as or even better than the doctor, and therefore do not seek medical care during the evolution of the disease unless they face situations they consider abnormal. Some analyses have shown[6] that an appropriate management of drugs, diet, exercise and other measures helps control disease. This, however, depends on the sick person's social support network. The chronically sick come to share their life with the disease. It is thus important that they themselves or their relatives identify any complicating symptoms during the evolution of the disease, so they can look for appropriate care.

The National Health Survey did not obtain any information regarding specific disease treatments and only recorded whether the sick person had used remedies and/or medication. One out of every four self-attended sick people had not received remedies or drugs. On the contrary, nine out of every ten of those who received medical care had been prescribed drugs. Although this is related to the demand for health care, it also expresses a certain form of medical practice based on prescription writing, the determinants of which have been studied by various authors.[21] It is nevertheless important to point to the fact that both those opting for self-care and those receiving medical care, use remedies and drugs simultaneously, which indicates a certain co-existence of traditional and allopathic medicines in Mexico.

The results show certain relevant aspects that help understand the way disease is attended and its relation with social and economic factors. They also generate many questions regarding the characteristics of the process of caring for sick people. How many of the self-attended individual s should have been seen by a doctor? How many of those seen by a doctor required a prescription? Of these, was the prescribed medicine appropriate? Is there a difference in the evolution of chronic diseases between those who opt for self-care and those who receive medical attention? How appropriate is the health care for children?

These and other issues should be analysed in regional and local studies in order to better understand the process of caring for disease in Mexico. Given the country's current socioeconomic situation, self-care is likely to continue as the principal response to illness, especially for the population living in poverty. The question is how to improve self-care as an adequate way to prevent and to attend illness. Solutions to this problem are not easy; of course, they should in the first place include improved living standards. Information and education channels should be developed on the prevention of certain illnesses and the appropriate selection and use of drugs should be considered, among other social and health-oriented actions. Efforts should also be made to provide easier access to quality medical care for when the sick and poor person considers this option appropriate.

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Road traffic injuries in an urban area in Mexico. An epidemiological and cost analysis*

Accident Analysis and Prevention

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Introduction

As countries modernize and develop, motorization increases, often with an impact on road safety (Castillo and Reyes, 1997; Roberts, 2001). In Mexico, since 1989, injuries caused by traffic accidents rank third among the ten leading causes of death and are the leading cause of death for persons between ages 1 and 64 (Secretaría de Salud, 1995).

Traditionally, road traffic injuries, including occupants of motor vehicles, cyclists, motorcyclists and pedestrians, have been considered as a single problem. That is, vulnerability, exposure conditions, and risk factors involved in their occurrence were considered to be the same (Mohan, 2000). An example of the need for a distinction in factors is the fact that in Mexico City, 54% of deaths by road traffic injuries are pedestrian injuries (Híjar et al., 2000), mainly to adults in productive ages. The number of non fatal, medically attended pedestrian injuries is estimated to be about 13 for each death; that means that about 9500 injured pedestrians a year require medical attention (Híjar et al., 2001).

The study of road traffic injuries as a single item, using aggregated measurements, or making regional comparisons, is not very useful and excludes any possible identification of the magnitude of the problem for individual traffic users, their spatial and local characteristics, thus limiting the analysis of their determining factors. This is specially true in developing countries like Mexico where users, mainly pedestrians, street vendors and cyclists, share and compete for road space with motor vehicles.

It is important not to forget that the public health problem which is the object of this article has clear and profound repercussions in daily life, as a cause of death, and also generating consequences and disabilities, since in most cases, the victims do not die, but will need to adapt to changes in roles and in their daily activities during several weeks or months, and in some cases permanently, as a consequence of the accident. Summarizing, this event leaves a deep mark in people who are involved, as a pedestrian or as a driver, due to all the affected spheres, which go from physical to emotional, economic, family and social areas. Thus, it is very important to include the costs analysis approach to know how populations can afford the expenses generated during the process of searching for and finding care for a road traffic-related injury.

Since this phenomenon is mainly present in urban areas, this paper presents an analysis of the problem of road traffic injuries in an urban area of Mexico. Its main objective is to analyze, using an epidemiological and costs

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analysis approach, the impact of road traffic injuries on the demand for services at hospital emergency rooms in Cuernavaca, Mexico.

Methods

Cuernavaca is a city of 600,000 people, located in the central region of Mexico, 50 km south of Mexico City. It is served by three regional hospitals, two of them belonging to the social security system, and one public hospital; there are also some small private hospitals. In this study, we include two general regional hospitals, one public hospital administered by the Ministry of Health, the other by the Mexican Institute of Social Security (Instituto Mexicano del Seguro Social IMSS), and two private hospitals.

The population under study included injured people who demanded medical attention at the emergency room (ER) of the hospitals included in the study, or people who died from injuries during the period between 15 February and 30 April 2001. A cross-sectional design was used and included only those events which occurred in public places and where injuries were the cause of demand for ER services or the cause of death.

The data were collected through interviews of injured people, based on a structured questionnaire which was applied by previously trained interviewers who were permanently at the ER of the selected public hospitals, just for the study purposes, 24 h a day during the study period. Death cases were recorded at the forensic service. Analyses of death cases are not included in this paper.

The studied variables were: age, sex, day and hour of occurrence of the event, alcohol consumption during the 6 h prior to the event, pre-hospital care delivered, external cause divided into: road traffic injuries, intentional injuries, other unintentional injuries. External cause was coded according to ICD, WHO IX Rev (1995) (WHO, 1995) E800±E999. We did a specific analysis of the road traffic category to analyze the differences between demands for emergency care for injuries resulting from crashes and those resulting from pedestrian injuries. The severity of injuries was grouped in two categories: non severe, meaning all kinds of injuries that were handled and solved at the ER, and severe, which included patients who needed hospitalization or died as a consequence of injuries. The types of injuries and regions where these were located were coded according to ICD, WHO IX Rev (1995) 800±999.

The statistical analysis included: description, distribution and categorization of variables. The association between the variables was determined by an estimate of the difference in the proportions, and $\chi 2$. The analysis of variables associated with the demand of the different external causes of injuries was done through the calculation of the odds ratio (OR), with a confidence interval of 95% (CI 95%). The statistical analysis was performed using the Stata 6.0 package.

For the cost analysis, we considered as independent variables: (A) insurance situation, defined as the right to use social security services (either private or public), as reported by the population (insured/non-insured); (B) external cause, grouped as: road traffic injuries, intentional injuries or another type of unintentional injuries; and (C) type of service-providing institution, grouped in three types of organizations: Mexican Social Security Institute (Instituto Mexicano del Seguro Social MSS), Ministry of Health (SSA) and private services (for-profit institutions). As a dependent variable, we considered the costs of the process of searching for and finding health care. We constructed this variable considering costs of transportation to the care providing unit and costs of health care, including medicines and laboratory tests.

Results

Between 15 February and 30 April 2001, there were 433 people who were injured in public places; that means an average of almost six cases per day, who demanded medical care for injuries at the ERs' of four hospitals in Cuernavaca, Mexico. Of these cases, 233 (54%) were due to road traffic accidents, 72% were due to crashes, and 28% were pedestrian and cyclist injuries. During the same time period, 54 deaths occurred on site, of which 30% were due to road traffic injuries.

Epidemiological analysis

Table 1 shows the distribution of variables according to the group of external causes where, considering the total number of cases included in the study, the mean age was figured to be 29.5 ± 17.5 years, with a predominance of males (71%) and schooling equal to high school level (57%).

The main differences observed are between the groups of traffic injuries and intentional injuries, especially with respect to alcohol intake, male gender, age 15±29 years, pre-hospital care and severity of injuries. Both groups of unintentional injuries were similar.

In Table 2 we can see the variables associated with the demand wfor emergency care due to road traffic injuries

Table 1. Variable distribution according to the cause of injuries

Variables	Road traffic		Intentional injuries		Other accidents		P value
	n	%	n	%	n	%	
Age (years)							
1–14	36	15.58	3	3.49	31	27.43	0.000
15–29	101	43.72	53	61.63	41	36.28	
30–59	78	33.77	28	32.56	31	27.43	
≥60	16	6.93	2	2.33	10	8.85	
Sex							
Male	164	70.39	73	83.91	72	63.72	0.007
Female	69	29.61	14	16.09	41	36.28	
Level of education							
None	13	6.63	2	2.67	8	7.34	0.044
Elementary	51	26.02	19	25.33	32	29.36	
High school	96	48.98	48	64	61	55.96	
College	36	18.37	6	8	8	7.34	
Employment status							
Yes	30	58.57	55	67.9	50	45.45	0.006
No	166	41.43	26	32.1	60	54.55	
Alcohol intake							
Yes	30	15.31	39	46.43	16	14.81	0.0000
No	166	84.69	45	53.57	92	85.19	
Transfer to hospital							0.0000
Ambulance	153	70.83	28	32.56	37	33.33	
Own means	51	23.61	55	63.95	69	62.16	
Other people	12	5.56	3	3.49	5	4.5	0.0000
Pre-hospital attention							
Yes	161	75.94	36	41.86	51	45.95	
No	51	24.06	50	58.14	60	54.05	
Time elapsed from injury to emergency care (h)							
0–1	127	66.84	47	58.75	58	56.31	0.363
>1–2	31	16.32	17	21.25	25	24.27	
>2–6	15	7.89	11	13.75	9	8.74	
>6–24	13	6.84	5	6.25	10	9.71	
>24	4	2.11	0	0	1	0.97	
Severity							
Severe	70	30.96	11	12.64	13	14.16	0.0000
Non severe	163	69.96	76	87.36	97	14.16	
Region of injury							
Head	64	27.83	34	40.48	20	18.18	0.0000
Thorax	29	12.61	6	7.14	2	1.82	
Abdomen	11	4.78	11	13.1	6	5.45	
Extremities	51	22.17	14	16.67	58	52.73	
Skin	75	32.61	19	22.62	24	21.82	

Table 2. Variables associated with the demand of emergency care for road traffic injuries and injuries caused by other accidents in public places

Variables	Road traffic		Other accidents		OR	CI	
	n	%	n	%		Low	High
Age (years)							
1–14	36	15.58	31	27.43	0.46	0.24	0.87
15–29	101	43.72	41	36.28	0.98	0.56	1.70
30–59	78	33.77	31	27.43	1.00		
≥60	16	6.93	10	8.85	0.64	0.26	1.55
Sex							
Male	164	70.39	72	63.72	1.35	0.84	2.17
Female	69	29.61	41	36.28	1.00		
Level of education							
None	13	6.63	8	7.34	0.36	0.11	1.16
Elementary	51	26.02	32	29.36	0.35	0.15	0.86
High school	96	48.98	61	55.96	0.35	0.15	0.80
College	36	18.37	8	7.34	1.00		
Employment status							
Yes	123	58.57	50	45.45	0.59	0.37	0.94
No	87	41.43	60	54.55	1.00		
	210		110				
Alcohol intake							
Yes	30	15.31	16	14.81	1.04	0.54	1.99
No	166	84.69	92	85.19	1.00		
	196		108				
Transfer to hospital							
Ambulance	153	70.83	37	33.33	1.00		
Own means	51	23.61	69	62.16	0.18	0.11	0.30
Other people	12	5.56	5	4.5	0.58	0.19	1.75
Pre-hospital attention							
Yes	161	75.94	51	45.95	1.00		
No	51	24.06	60	54.05	0.27	0.17	0.44
Time elapsed from the injury to emergency care (h)							
0–1	127	66.84	58	56.31	1.00		
>1–2	31	16.32	25	24.27	0.57	0.31	1.04
>2–6	15	7.89	9	8.74	0.76	0.31	1.84
>6–24	13	6.84	10	9.71	0.59	0.25	1.43
>24	4	2.11	1	0.97	1.83	0.20	16.71
Severity							
Severe	70	30.04	16	14.16	2.60	1.44	4.71
Non severe	163	69.96	97	85.84	1.00		
Region of injury							
Head	64	27.59	20	18.02	1.02	0.52	2.02
Thorax	29	12.5	2	1.8	4.64	1.03	20.89
Abdomen	11	4.74	6	5.41	0.59	0.20	1.76
Extremities	51	21.98	58	52.25	0.28	0.16	0.51
Skin	75	32.33	24	21.62			

in comparison with injuries due to other accidents. Severity of injuries (OR 2.60, CI 1.44±4.71) and thorax injuries (OR 4.64, CI 1.03±20.89) are the variables showing statistical differences between the two groups of patients.

Taking into account the differences between road traffic users, we analyzed the variables associated with cases who demanded emergency care for pedestrian injuries in comparison with those injured in crashes. The most important variables were: age under 14 years old (OR 5.9, CI 2.5±13.9), being unemployed (OR 2.1, CI 1.20±3.96); non schooling (OR 13.9, CI 3.08±63.13), non pre-hospital care (OR 2.48, CI 1.29±4.79) and having injuries in the abdominal region (OR 4.5, CI 1.19±16.98) (Table 3).

Table 3. Variable associated with the demand of emergency care for pedestrian injuries compared to crash injuries

Variables	OR	CI	
		Low	High
Age (years)			
1–14	5.90	2.50	13.94
15–29	0.67	0.32	1.42
30–59	1.00		
≥60	2.00	0.64	6.26
Sex			
Male	0.69	0.37	1.27
Female	1.00		
Level of education			
None or elementary	6.93	3.55	13.51
High school/college	1.00		
Employment status			
No	2.18	1.20	3.97
Yes	1.00		
Alcohol intake			
No	0.29	0.10	0.88
Yes	1.00		
Transfer to hospital			
Ambulance	1.00		
Own means	4.25	2.17	8.35
Other people	3.78	1.14	12.51
Pre-hospital attention			
No	1.00		
Yes	2.48	1.29	4.79
Time elapsed from the injury to emergency care (h)			
0–1	1.00		
>1–2	0.85	0.35	2.06
>2–6	4.86	1.56	15.21
>6–24	0.44	0.09	2.09
>24	7.30	0.74	72.44
Severity			
Severe	0.69	0.36	1.32
Non severe	1.00		
Region of injury			
Head	0.79	0.37	1.70
Thorax	0.09	0.01	0.72
Abdomen	4.50	1.19	16.98
Extremities	1.80	0.85	3.82
Skin	1.00		

Cost analysis

A total of 26% of patients had to pay for medical care, 70% made no direct payment. Of all users who paid a cost during the process of searching for and finding health care, 53% paid less than US$ 100.00.

Table 4 shows the results related to the cost of care in the social security system: of all users with social security, only 2% paid more than US$ 100.00 for the service; for users without social security, 40% paid for services, most of them within a range of payment under US$ 20.00. With respect to the cost of care by type of institution, users who received care at IMSS, as well as at SSA, paid an average amount under US$ 20.00, and in the private sector, over US$ 100.00.

With respect to the origin of payment, in 100% of cases, those who received care at a private hospital paid through a private health insurance, while those who got care at IMSS and SSA paid directly out-of-pocket at the time they received the required medical service.

Data according to the external cause show that most patients who demanded care for a traffic-related injury paid more than US$ 80.00; for intentional injuries or other types of accidents, the cost of care was less than US$ 20.00.

Of the total number of patients injured in road traffic accidents, comparing those involved in crashes with those injured as pedestrians, the main differences are that pedestrians have higher costs for health care, including trans-

Table 4. Costs generated during the process of searching for and obtaining medical care for injuries in Mexico

Variable of analysis	Type of population		Type of institution**		
Cost[a]	Insured	Uninsured	IMSS	SSA	Private
10.00–20.00	12.0	71.0	80.0	76.0	0.0
21.00–80.00	1.0	14.0	0.0	16.0	0.0
81.00–100.00	0.0	2.0	0.0	2.0	3.0
>100.00	87.0	3.0	20.0	4.0	97.0

[a] In US$. Exchange rate: US$ 1.00 = 9.25 Mexico dollars (November 2001).
* Pearson statistical test: 41.15, P < 0.05.
** Pearson statistical test: 50.66, P < 0.05.

Table 5. Expenses and origin of payment for crash and pedestrian injuries

Variables	Crash		Pedestrian		*P* value
	n	%	n	%	
Paid for medical care					
Yes	64	41.29	15	23.44	0.012
No	91	58.71	49	76.56	
	155		64		
Pay for transport					
Yes	3	2.26	19	32.2	0.000
No	130	97.74	40	67.8	
	133		59		
Origin of payment					
Out-of-pocket	27	43.55	25	80.65	0.005
Medical insurance	26	41.94	3	9.68	
Other	9	14.51	3	9.68	
Total	62		31		

portation 80% of them had to pay out-of-pocket, while only 45% of crash victims had to pay in this manner ($P < 0.05$) (Table 5).

Discussion

Combining epidemiological and cost approaches allows us to incorporate levels of analysis that lead to a better understanding of the impact of road traffic injuries beyond the health problem, including the economic impact.

Results obtained with respect to sex, age, alcohol intake, transfer to the hospital, pre-hospital care, severity and region of injuries, coincide with those reported in other studies (Arreola-Risa et al., 1995; Mock et al., 1998; Arreola-Risa and Speare, 1999). Within the road traffic category, results related to level of schooling, employment status and age allow us to state that this event, as a public health phenomenon, incorporates two types of social actors (drivers and pedestrians) who have very little in common but the urban space where the accident happened. Besides, these actors belong to very different and contrasting social and probably cultural groups, where one of them is at a disadvantage.

The findings of this study also allow us to identify pedestrian injuries as a problem that particularly affects low-income populations and increases inequalities (Arreola-Risa et al., 2000) in a population that is already unequal. We must highlight the fact that, although the majority of the uninsured population makes payments that have a lower cost than the cost for the insured population, the uninsured represent 80% of users who have to pay for the service. Thus, in terms of the economic impact to users' pockets and the health system's financial protection, the social response to the uninsured is the problem which most urgently needs to be solved. A cost of 3±6 daily minimum salaries for health care is an economic barrier to access for users lacking social security and whose income is no more than a minimum salary (minimum salary per day in Mexico is US$ 4.00). In the same way, costs of transportation turned out to be greater for the uninsured population, especially in pedestrian cases, which shows that, in terms of the economic dimension of accessibility, the infrastructure of health services is less accessible.

These results stand out because of the fact that the uninsured population is mostly outside the formal economy and thus, has a lower annual income and a more irregular one, while having less protection from health programs. This situation becomes more severe in the case of traffic-related injuries since, compared to intentional accidents and other types of accidents, it is precisely the traffic-related injury which turned out to have a greater cost for health care. This was to be expected; what is relevant in this result is that, for the first time, health services required for accidents in Mexico are evaluated from an economic perspective.

This aspect is interesting because it goes against the principles of the Mexican health system which state that, in terms of equity and economic accessibility, the low-income population should pay less for health care. In other words, catastrophic expenses generated by the demand for health services needed after an accident, in this type of population, should be mostly absorbed by the financial protection mechanisms of the health system.

Actually, it is clear that the perspective of costs to the consumer of health services is a variable that should be included in the economic (Hasselberg et al., 2001; Leigh et al., 2000; Arredondo et al., 1999) epidemiological or any other kind of analysis, in order to acquire more knowledge and reach possible solutions to the substantial problems faced by health care systems. This is mainly the case when facing the challenge of how to make health services more accessible and equitable within the framework of present health sector reforms and, particularly, of the 2001±2006 National Health Program, where the Action Program for accidents is one of the main strategies to be implemented (SSA, 2001).

Having knowledge of the factors that favor the occurrence of a road traffic accident and of the differences between the different affected groups (drivers, occupants, pedestrians) is very important from the public health point of view, since it allows us to propose prevention measures based on a multidisciplinary focus including the health, education, labor, transportation and communication areas. On the other hand, it helps us identify target groups for a proposal for concrete interventions.

This study is the only one in Mexico including an epidemiological and costs analysis in approaching the problem of road traffic injuries. Similar methods must be undertaken elsewhere, especially in developing countries, to develop the specific and local data needed to reduce this important public health problem.

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¿Cuándo utilizan servicios de salud las mujeres que viven en condiciones de violencia de pareja?*

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La magnitud de la violencia doméstica se refleja en el aumento de las tasas de mortalidad, morbilidad, discapacidad permanente, incapacidad temporal, desequilibrio emocional, ausentismo laboral (2, 11, 17) y además, en los daños psicológicos y el impacto social que ocasionan (14, 22). En el caso concreto de la violencia en el hogar, las mujeres constituyen uno de los grupos más afectados. La relación tan cercana entre agredidos y agresores (5, 6), se recrudece en el caso de las mujeres maltratadas por la pareja masculina.

Diversos estudios (2) señalan que las mujeres maltratadas por sus parejas tienen un mayor riesgo de ser victimizadas nuevamente en comparación de quienes son agredidas por desconocidos; ésta situación aunada a otros factores pone en evidencia el peso de las condiciones sociales en la violencia de pareja y su influencia en la utilización o no de los servicios de salud, para resolver las lesiones provocadas por ésta (20).

Con base a lo anterior, en el año 1999 se aprobó la Norma Oficial Mexicana denominada "Criterios para la Atención Médica de la Violencia Familiar NOM- 190-SSA1±1999" (3).

Los estudios realizados en México hasta la fecha, no han dado cuenta de cuáles son las características de las mujeres que utilizan los servicios de salud para atender las lesiones recibidas a consecuencia de la violencia de pareja, en comparación con aquéllas que en las mismas condiciones, no lo hacen.

El objetivo del presente artículo fue analizar los factores asociados a la utilización de servicios públicos de salud en mujeres lesionadas a consecuencia de la violencia de pareja.

Material y métodos

El presente artículo se elaboró con base en la información generada por la Encuesta Nacional sobre Violencia contra las Mujeres (ENVIM). Se utilizó un diseño transversal y se llevó a cabo de noviembre 2002 a marzo del 2003 en los 32 estados del país.

La violencia contra la mujer se definió como: "*un patrón repetitivo de maltrato por parte de la pareja masculina hacia la mujer, caracterizado por una serie de conductas coercitivas que pueden incluir violencia física, emocional o sexual*".

Para la medición de la violencia de pareja se diseñó una escala de 27 reactivos (23). Esta escala explora los distintos tipos de violencia: psicológica o emocional, sexual y física. Se utilizó el Análisis Factorial para determinar el origen y agrupamiento de los reactivos, y se obtuvie-

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ron cuatro factores que explicaron 62.3% de la varianza. La confiabilidad se determinó empleando el Alpha de Cronbach, que documentó una consistencia de 0.99. Con la combinación lineal de estos factores se construyó el Indice de Severidad de Violencia de Pareja (ISVP) que se categorizó en: 1) No violencia; 2) media ± DS violencia no severa; 3) media más valores por arriba de 1 DS como violencia severa (24).

Selección de las mujeres entrevistadas

Se realizó un muestreo probabilístico estratificado bietápico. En la primera etapa, se seleccionaron unidades médicas con probabilidad proporcional acorde al tamaño por tipo de institución. En la segunda, se utilizó un muestreo sistemático para la selección de mujeres mayores de 14 años usuarias de servicios de salud. Las consideraciones éticas se resolvieron informando a las mujeres seleccionadas sobre los objetivos del estudio y a quienes aceptaron participar, se les solicitó otorgar su consentimiento por escrito, y se les garantizó la confidencialidad de la información. La tasa de respuesta fue de 98%.

Las variables analizadas fueron las siguientes:

1) Relacionadas con la usuaria: edad y sexo; escolaridad, actividad laboral e ingreso económico en los 15 días previos a la entrevista, acceso a los servicios de salud de la seguridad social, condición civil y capacidad para decidir sobre el gasto en el hogar. Asimismo se incluyó el consumo de alcohol tanto de la mujer como de su pareja.
2) Búsqueda de apoyo en el personal de salud.
3) Tipo de institución que proporcionó la atención (Seguridad social o abierta).*

Se generó un índice de estrato socioeconómico (16) empleando una combinación lineal de cuatro variables: promedio de escolaridad relativa de los integrantes del hogar, el trabajo de más alto nivel (en términos de ingreso) en el hogar, el número de electrodomésticos, y la ausencia de hacinamiento.[⊠] El índice se categorizó como bajo, medio y alto.

La Variable dependiente se definió como la utilización de servicios de salud para atender alguna de las lesiones provocadas por violencia de pareja. Un ejemplo de cómo se exploró es el siguiente: ¿A consecuencia del maltrato que sufrió en los últimos doce meses, usted presentó moretones? En el caso de una respuesta afirmativa se preguntaba a la entrevistada si había acudido a alguna institución de salud para atenderse esa lesión. Estas preguntas se hicieron respecto a trece diferentes tipos de lesiones y la forma en que se estructuraron permitió identificar además el tipo de lesión y su gravedad. Esta última se definió a partir del tipo de servicio de salud que se requirió para atender la lesión.

Se realizó un análisis bi-variado utilizando chi cuadrada y regresión logística y, multivariado, empleando regresión logística binaria. El modelo final incluyó las variables que en el análisis bivariado mostraron un valor de $p<0.25$ (7). Después de fijar los efectos principales, se probaron las interacciones y se sostuvieron en el modelo final solamente si el valor era de $p<0.15$. El ajuste global del modelo se verificó con la prueba de bondad de ajuste de Pearson, y se le consideró adecuado si el valor era de $p>0.10$. Los paquetes estadísticos empleados fueron SPSS 10 (12) y STATA 8.2® (21). Tanto para el bivariado como para el multivariado, los intervalos de confianza se calcularon con errores estándar sólidosos. Como los datos observados correspondían a mujeres que contaban con la cobertura de parte de una determinada institución, las observaciones dentro del cluster están correlacionadas mientras que las observaciones entre los cluster, no lo están (26).

Resultados

Se obtuvo información de 24,958 usuarias de servicios de salud de instituciones públicas que refirieron tener pareja o haberla tenido en el último año. Una de cada cinco indicó haber sufrido algún tipo de violencia por parte de su pareja; de éstas, sólo 7.3% acudió a los servicios de salud para atenderse de lesiones intencionales (figura 1).

En el cuadro 1 se presentan las principales características socioeconómicas de 1,264 mujeres que presentaron alguna lesión debido a la violencia por parte de su pareja; cabe destacar los factores siguientes: edad de entre 25 y 34 años, nivel de estudios de primaria; otras que trabajan fuera del hogar. Más de 80% son casadas o viven en unión libre, poco más de 90% no consumen alcohol o lo hacen de manera ocasional. Un 94% pertenece a los estratos bajo y medio y cerca de la mitad (47%) no tienen acceso a los servicios de la seguridad social; más de dos terceras partes (76%) son víctimas de violencia severa. Aproximadamente la mitad de ellas refiere tener la capacidad para decidir sobre el gasto del hogar.

* La seguridad social da cobertura al 60.1% de la población y los servicios de salud de Ministerio al 34% Secretaría de Salud (8, 10).

[⊠] Se considera hacinamiento cuando existe 2.5 habitantes o más por dormitorio.

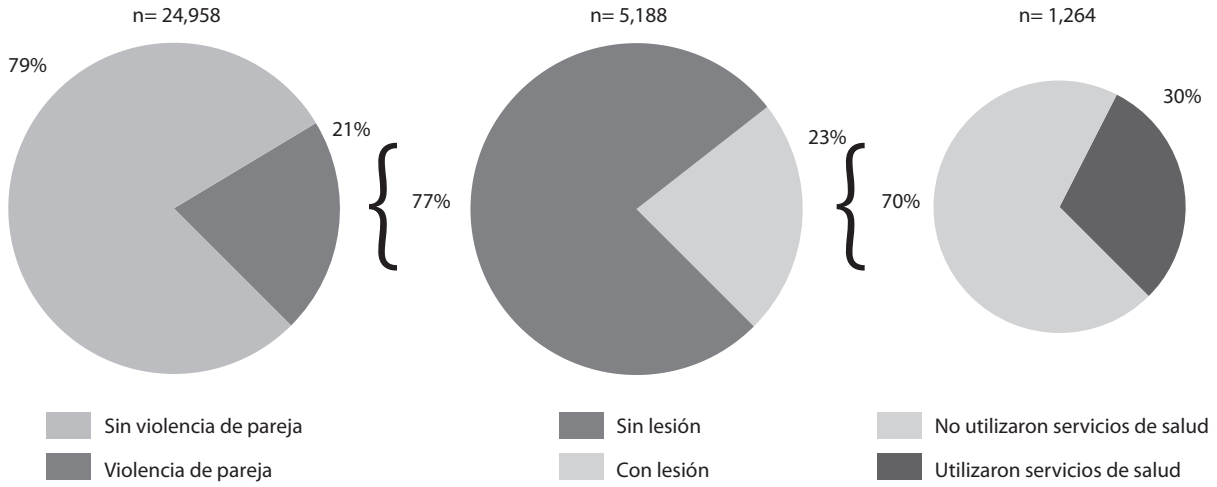

Figura 1. Proporción de mujeres maltradas, mujeres con consecuencias de salud y utilización de servicios de salud

El 71.7% del total de mujeres de este grupo(n=1264), refirió haber sufrido en una sola ocasión alguna lesión leve (moretones, dolores en el cuerpo, etc.). Sin embargo, 28.3% señaló presentar la combinación de más de un tipo de lesión; de este porcentaje 10.8% manifestó haber sufrido lesiones severas que requirieron cirugía y hospitalización.

En el cuadro 2, se observa que las mujeres que presentaban lesiones físicas visibles o que requerían algún procedimiento médico como sutura de heridas, reducción de fracturas o atención por quemaduras, fueron las que más utilizaron los servicios de salud. Llama la atención, no obstante, que 18% de las mujeres que tuvieron alguna fractura no utilizaron dichos servicios. Los síntomas generales como desmayos y pérdida de la función de alguna parte del cuerpo fueron los que se asociaron con una mayor demanda de atención. En 16% (n=61) de las mujeres que utilizaron servicios de salud, la lesión fue grave (cuadro 2). Como consecuencia de la violencia sexual, las causas que exigieron mayor atención fueron las infecciones genitales y el sangrado transvaginal.

De las mujeres que acudieron a los servicios de salud para atenderse, 45% lo hizo preferentemente en instituciones de la seguridad social.

Respecto a la búsqueda de apoyo en el personal de salud, solamente 5.9% (n=311) de las mujeres que en el último año han sido maltratadas por su pareja habló con el personal de salud sobre su situación de maltrato. Las principales razones para no hacerlo fueron: falta de confianza (50.4%), pena o vergüenza (31.7%), porque es algo muy privado (18.3%) o percibir que el personal de salud dispone de poco tiempo (9%).

En el cuadro 3 se presentan los factores asociados a la utilización de servicios de salud para la atención de las lesiones, con RM crudas; destacan entre esto edad mayor de 24 años, tener una actividad remunerada, contar con acceso a los servicios de seguridad social, consumir alcohol más de una vez al mes, pertenecer al estrato socioeconómico alto, ser objeto de violencia severa y que la mujer tenga capacidad de decidir sobre el gasto de la casa.

En el cuadro 4 se presentan las variables que aparecen en el modelo de regresión multivariado ajustado por violencia severa y el tener acceso a la seguridad social fueron significativas: Edad entre 25 y 34 años (RM_A 1.57, IC 95% 1.9-2.06), 35 a 44 (RM_A 1.44, IC 95% 1.19±1.7), 45 a 54 años (RM_A=1.64 IC 95% 1.23-2.19) y 55 años y más (RM_A=1.18 IC 95% 1.06-1.33). Consumo de alcohol en la mujer (RM_A=1.66 IC 95% 1.57- 1.75); estrato socioeconómico alto y la capacidad de la mujer de decidir sobre el gasto (RM_A=1.29 IC 95% 1.07-1.54). Ninguna de las interacciones resultó ser significativa (p>0.15). El ajuste global del modelo fue adecuado (bondad de ajuste p=0.23).

Discusión

Uno de los hallazgos importantes de este análisis fue identificar el bajo porcentaje de mujeres maltratadas por la pareja que solicitan servicio médico formal para la atención de sus lesiones. En la mayoría de los estudios realizados en nuestro país solamente se ha analizado a esta proporción de mujeres, y aunque en éstos se ha señalado que tal proporción es sólo la punta del iceberg (4, 19) el

Cuadro 1. Características de las mujeres que sufren violencia de pareja y utilización de servicios de salud para la atención de sus lesiones, ENVIM 2003

Variables	No utilizó		Sí utilizó	
	n	%	n	%
Edad años*				
55 y más	40	4.6	17	4.4
45 a 54	96	10.9	52	13.6
35 a 44	213	24.2	100	26.1
25 a 34	307	34.8	147	38.4
15 a 24	225	25.5	67	17.5
Totales	**881**	**100.0**	**383**	**100.0**
Escolaridad				
Analfabeta	94	10.4	38	9.9
Primaria	383	43.5	166	43.3
Secundaria	256	29.1	103	26.9
Preparatoria y más	113	12.8	58	33.9
Licenciatura y más	35	4.0	18	4.7
Totales	**881**	**100.0**	**383**	**100.0**
Actividad laboral*				
No trabaja fuera del hogar	417	47.3	157	41.1
Trabaja fuera del hogar	465	52.7	225	58.9
Totales	**881**	**100.0**	**382**	**100.0**
Condición civil*				
Separada, divorciada o viuda	122	13.8	71	18.5
Unión libre	245	27.8	8213	21.4
Casada	487	55.3	217	56.7
Soltera	27	3.1	13	3.4
Totales	**881**	**100.0**	**383**	**100.0**
Consumo de alcohol*				
Más de una vez al mes	46	5.3	33	8.7
Ocasionamente	455	52.4	203	53.3
No ingiere alcohol	368	42.3	145	38.0
Totales	**869**	**100.0**	**381**	**100.0**

Variables	No utilizó		Sí utilizó	
	n	%	n	%
Estrato socioeconómico**				
Bajo	456	51.8	189	49.3
Medio	414	47.0	182	47.5
Alto	11	1.2	12	3.2
Totales	**881**	**100.0**	**383**	**100.0**
Capacidad de la entrevistada para decidir cómo se gasta el dinero*				
No	464	52.7	176	45.9
Sí	417	47.3	207	54.1
Totales	**881**	**100.0**	**383**	**100.0**
Ser derechohabiente*				
Sin seguridad social	499	56.6	180	47.5
Seguridad social	382	43.4	201	52.5
Totales	**881**	**100.0**	**383**	**100.0**
Severidad de la violencia de pareja				
Violencia severa	654	75.8	324	86.6
Violencia no severa	209	24.2	50	13.4
Totales	**863**	**100.0**	**374**	**100.0**
Consumo de alcohol de la pareja				
Todos o casi todos los días	139	16.5	74	20.4
1 a 3 veces a la semana	230	27.3	94	25.9
1 a 3 veces al mes	143	17.0	61	16.8
Ocasionalmente	270	32.0	130	28.4
No toma	60	7.0	31	8.5
Totales	**843**	**100.0**	**380**	**100.0**

* p < .05, **>.05, p <.1

documentarlos a través de la encuesta es de gran valor. Otro hallazgo ha sido la identificación de que existen, además de las lesiones físicas, diferentes tipos de consecuencias para la salud, tales como infecciones y sangrados vaginales, desmayos, dolores en el cuerpo. Estos no llevan a una atención inmediata, sino a una demanda mediata o tardía de los servicios de salud, y además no pueden ser reconocidos por el personal de salud como resultado de la violencia de pareja. Este tipo de consecuencias en la salud, ha sido poco estudiado (1).

Cuadro 2. Consecuencias de la violencia de pareja en la salud y utilización de servicios de salud, ENVIM 2003

Variables	No utilizó		Sí utilizó	
	n	%	n	%
Tipo de lesión*				
Moretones	815	71.4	327	28.6
Heridas punzo-cortantes	23	25.8	66	74.2
Fracturas	16	18.2	72	81.8
Pérdida de dientes	14	27.5	37	72.5
Quemaduras	9	33.3	18	66.7
Síntomas generales*				
Desmayos	59	37.6	98	62.4
Dolores en el cuerpo	460	63.0	270	37.0
Pérdida de uso o función de alguna parte del cuerpo	18	34.6	34	65.4
Patología asociada a violencia sexual*				
Daños post. relaciones sexuales	78	40.6	114	59.4
Sangrado trans-vaginal	50	35.2	92	64.8
Infección genital	50	30.3	115	69.7
Severidad de la lesión				
No severa	877	73.1	321	26.8
Severa	4	6.2	61	93.8
Institución de preferencia para la atención				
Instituto Mexicano del Seguro Social			116	30.3
Instituto Seguridad y Servicio Social			56	14.6
Secretaría de Salud			149	39.0
Privados			61	15.9

* Las categorías no son excluyentes, 28.3% de las mujeres indicó más de un síntoma o patología

Cuadro 3. Factores asociados a la utilización de servicios de salud debido a violencia de pareja

Variables	RM Cruda	Sig	IC 95%
Socio-demográficos de la mujer			
Edad (años)			
15 a 24	1+		
25 a 34	1.56	0.02	1.07 - 2.28
35 a 44	1.45	0.00	1.23 - 1.7
45 a 54	1.68	0.03	1.05 - 2.67
55 y más	1.24	0.00	1.07 - 1.43
Actividad laboral			
No trabaja fuera	1+		
Trabaja fuera del hogar	1.25	0.005	1.07 – 1.46
Consumo de alcohol			
No ingiere alcohol	1+		
Ocasionalmente	1.04	0.47	0.93 – 1.74
Más de una vez al mes	1.65	0.00	1.42 – 1.92
Condición de aseguramiento			
Sin acceso a la seguridad social	1+		
Con acceso a la seguridad social	1.4	0.00	1.05 – 1.88
Estrato socioeconómico			
Bajo	1+		
Medio	1.03	0.36	0.96 – 1.11
Alto	2.11	0.00	1.87 – 2.39
Percepción de roles			
La entrevistada decide cómo se gasta el dinero			
No	1+		
Sí	1.21	0.003	1.06 – 1.37
Relacionadas con la violencia			
Gravedad de la lesión			
No grave	1+		
Moderada	41.53	0.00	15.2 – 113
Violencia de pareja			
Leve	1+		
Severa	3.08	0.00	2.84 – 3.34

+Categoría de referencia.

Encontrar que tanto la condición de trabajo, el tener derecho a los servicios públicos y que las mujeres tengan un nivel de decisión mayor en la vida cotidiana, se relacionen con un mayor uso de servicios de salud formales por parte de las mujeres maltratadas, sugiere la existencia de un sector de la población que resuelve por medios propios su problema. Revela, asimismo, que hay un grupo más desprotegido que enfrenta en condiciones de inequidad las consecuencias de la violencia de pareja. Estos resultados señalan, una vez más, las diferencias en el nivel de

Cuadro 4. Modelo ajustado de variables asociadas con la utilización de servicios de salud debido a violencia de pareja, ENVIM 2003

Variables	RMA	Sig	IC 95%
Edad (años)			
15 a 24	1+		
25 a 34	1.57	0.01	1.09 - 2.06
35 a 44	1.44	0.00	1.19 – 1.7
45 a 54	1.64	0.00	1.23 – 1.33
55 y más	1.18	0.00	1.06 – 1.33
Consumo de alcohol de la mujer			
No ingiere alcohol, o sólo ocasionalmente	1+		
Más de una vez al mes	1.66	0.00	1.57 – 1.75
Condición de aseguramiento			
Sin acceso a la seguridad social	1+		
Con acceso a la seguridad social	1.36	0.00	1.14 – 1.61
Estrato socioeconómico			
Bajo y medio	1+		
Alto	1.36	0.01	1.07 – 1.76
Violencia de pareja			
Leve	1+		
Severa	2	0.00	1.89 – 2.12
Percepción de roles			
La entrevistada decide cómo se gasta el dinero			
No	1+		
Sí	1.37	0.002	1.09 – 1.66

* RMA: Razones de momios ajustadas por las variables contenidas en el cuadro. Los intervalos de confianza al 95% fueron calculados con errores estándar robustos ajustados por «clustering» (institución).
+ Categoría de referencia.
Bondad de Ajuste Pearson Chi2 96.32; p=0.23

la toma del poder de las mujeres, aún en el contexto de la violencia de pareja.

El hecho de haber encontrado una relación entre el consumo de alcohol de la mujer y la mayor utilización de los servicios de salud, se debe más que a una asociación directa, a que en el modelo se incluye la severidad de la violencia (18, 25). Lo mismo ocurre con el consumo del alcohol en la pareja (13).

Con relación a las limitaciones de este estudio, es necesario considerar los siguientes aspectos. 1) Se trata de un estudio transversal con las limitaciones inherentes al diseño, como el problema de la ambigüedad temporal. 2) El tipo de población a la que se dirigió el estudio, usuarias de servicios de salud públicos, deja fuera a las mujeres con menores recursos y a otras de estratos socioeconómicos altos (9), por lo que, de existir sesgo, no se sabe con precisión el sentido del mismo. 3) La estructuración de la pregunta sobre la utilización de servicios de salud y el tipo de lesión, no permitió saber en cuántas ocasiones diferentes las mujeres emplean servicios de salud formales. 4) La forma en la que se midió el consumo de alcohol, a partir del autoreporte, no permite dar cuenta de los patrones de consumo del mismo.

Un punto que hay que destacar es la dificultad de las mujeres maltratadas para informar sobre el problema al personal que las atiende, sobre todo si consideramos que las causas para no hacerlo coinciden con lo documentado por otros autores (2, 4). Destaca el hecho de que las mujeres perciben al personal de salud como desinteresado en su problema, lo que les produce la sensación de que su necesidad de atención se toma a la ligera. Con base en los resultados del estudio se pueden señalar algunas de las dificultades que enfrenta la aplicación de la normatividad mexicana (5):

- El bajo porcentaje de mujeres con algún tipo de lesión o daño por maltrato que usan los servicios de salud. Se requieren nuevas estrategias para su detección, que deberán rebasar el ámbito de los servicios de salud.
- La solicitud de los servicios de salud está supeditada a la gravedad de las lesiones ocasionadas, al limitarse a la salud física y dejar fuera todo lo relacionado con la salud mental u otro tipo de secuelas.
- La poca o nula participación del personal de salud en la atención de este problema, aunada a la falta de confianza, especialmente en el médico, dificulta su detección y por consecuencia su notificación.

Por último, es fundamental desarrollar investigaciones que incluyan los daños a la salud mental, como consecuencia y como causa del problema. Es necesario definir el papel que debe desempeñar el sector salud tanto en la prevención, como en las respuestas a las necesidades de las víctimas de la violencia. Análisis contextuales darían un equilibrio a la participación del sector salud, sin circunscribir el problema al aspecto médico, enfatizando la participación intersectorial con visión multidisciplinaria y definiendo acciones y compromisos claros (6).

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Patient-doctor decision-making about treatment within the consultation. A critical analysis of models*

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Introduction

In this paper we want to explore some of the limitations of models of patient involvement in treatment decision-making. Specifically, we will consider the models of interpretative decision-making, shared decision- making and informed decision-making. To some extent these limitations are simply limitations of *models* (i.e. models are inherently and necessarily limited hat is, so-to-speak, how they work), and we will begin by acknowledging this fact. But we also want to highlight two aspects of the process of decision-making, which, we would argue, are crucial to an understanding of doctor±patient decision-making and yet are substantially neglected by the models. These two aspects relate to the questions '*which* decisions should patients be involved in?' and '*how* should patients be involved in decision-making?' More specifically they concern (1) the framing problem he construction of the option-set which both frames decision-making and is, in part, a product of decision-making; (2) the nature of reasoning problem the nature of the reasoning±communication represented in any process of joint decision-making. Lying behind these limitations, we want to suggest, is a more fundamental problem. We would argue that whilst these models represent some very important aspirations, they pay insufficient attention to, and are insufficiently explicit about, the dilemmas of professional ethics which are played out in professional±patient relationships. This, it seems to us, is where their real limitation lies.

In the main body of the paper we will not spend much time interrogating the nature and variety of models. We will proceed as if the models discussed have relatively clear-cut and broadly similar purposes. However, it is essential to signal at the outset that the role and value of these kinds of model are both contested and varied. However, one thing that might be said by way of generalisation is that it is in the nature of models to 'abstract from' and simplify the multi-dimensional realities that they represent. (As is often said a *map* which contained all the information found in the reality it depicted would be valueless as a *map*.) It is, therefore, not a credible criticism of models to point out that they do not include all the things that they might include. Nor can we expect there to be any straightforward 'match' between models and the world of practice. There is inevitably an 'interpretative space' between the models and practice. Thus, it is not simply that there may sometimes be a kind of *mismatch* between a model and practice, it is also that we are often

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unsure *what would count* as an application of a specific model in real-world circumstances.

Having acknowledged some of these complexities we will take it that models of patient involvement are designed to describe and/or prescribe some conception of 'good practice', i.e. patient involvement is being made salient through the models because of its *instrumental* or *intrinsic* value. Instrumental (or practical) value refers to such things as patient involvement leading to patients who "make wiser decisions, come to a common understanding with their physicians, and adhere more fully to treatment" (Epstein, Alper, & Quill, 2004); hopefully this leads to a happier, healthier patient. Intrinsic value refers to philosophical or ethical ideals, such as 'respect for persons', which underlie or inform patient involvement policies; ideals that can be seen as crucially important in themselves, irrespective of the practical effects of involvement. Given that this account describes the basic thrust underpinning models such as the ones considered here, there are three broad sets of evaluative issues that arise about the 'space' between models and practice. We could, for example, ask (1) Is there a rough fit between (any of) these models and some real world practices? (2) What are the factors that might enable or constrain the possible realisation and enactment of the model in practice? (3) Do (or would) enactments of the models serve the instrumental or intrinsic ends that their advocates would wish? The remarks we make in the review of the models that make up the main body of the paper will touch upon all of these questions, but these questions do not form the central thread of our account. Rather, as we have already indicated, we will concentrate on exploring what we see as some of the limitations of the models limitations which, we would argue, make it difficult to answer any of these questions satisfactorily. These models of doctor±patient decision-making, we are suggesting, are not sufficiently well-defined to answer these crucial evaluative questions. It seems to us that before they can be subjected to these kinds of evaluations the underlying assumptions that these models make about the relative roles of professionals and patients need to be questioned and further elaborated.

Describing the decision-making models

Currently, there are four frequently discussed models of patient±doctor decision-making about treatment: Paternalistic decision-making, interpretative decisionmaking, shared decision-making and informed decisionmaking (Emanuel & Emanuel, 1992; Laine & Davidoff, 1996; Charles, Gafni, & Whelan, 1997, 1999a, b). There is no universally agreed definition of these models and what they include. On the contrary, there is much confusion and overlap in how these models are understood (Charles et al., 1997). Furthermore, as we will show, there is considerable debate about what the application of these models would involve.

In broad terms, decision-making models vary in the respective roles that doctor and patient take in the final selection of treatment. From the point of the patient this means the models differ according to the degree to which the patient is able to take part in, and shape, the choice of their treatment (see Fig. 1). In the paternalistic model, practiced over centuries, the doctor chooses the treatment after evaluating information about the disease of the patient, the treatment options and the probabilities of outcomes. In the interpretative model (Emanuel & Emanuel, 1992), the doctor decides about a treatment plan, but does so by taking the values and preferences of the patient into consideration. Shared decision-making means that at least two participants doctor and patient re involved, both parties (doctors and patients) take steps to participate in the process of treatment decision-making, they share information and a treatment decision is made to which both parties agree (Charles et al., 1997). Finally, in the informed decisionmaking model the patient decides on his or her own after the doctor discloses information about benefits, risks and alternative treatment options.

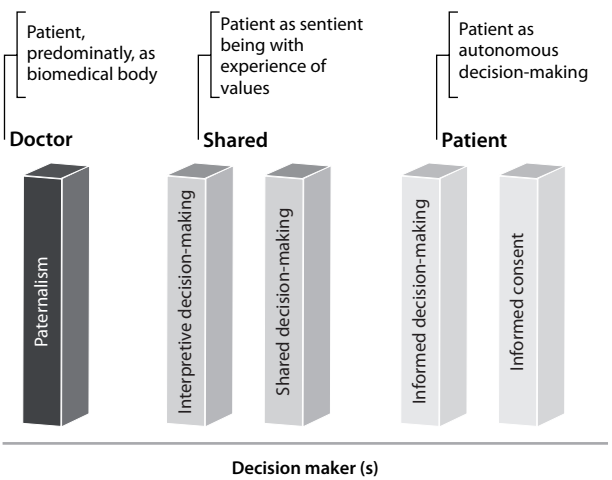

Figure 1. Decision-making models including informed consent.

The informed decision-making model is superficially similar to informed consent as in both cases the patient has the final decision-making authority. But there are two crucial differences. First, in contrast to informed decision-making, informed consent is a form of legal authorisation for which certain criteria need to be met before the patient's authorisation is valid, such as the patient's competence, the patient's understanding of the information disclosed, freedom from coercion or manipulation by the doctor and the patient's intended authorisation (Faden & Beauchamp, 1986; General Medical Council, 1998). Second, in informed decisionmaking the doctor presents all available treatment options and then the patient decides which option to choose, whereas informed consent does not require that the patient select one treatment *out of a range of options*. Usually, the doctor asks the patient for permission relating to *one* health care intervention whilst simply informing about others.

Some of these decision-making models derive from wider conceptions of doctor±patient interaction and include factors unrelated to the immediate process of decision-making. We will briefly describe these wider conceptions in order to distinguish them from the decision-making models per se and thereby to indicate *why* we have excluded them in our discussion. For instance, shared decision-making comes out of patientcentred medicine. Patient-centred medicine describes the ways in which doctors should practice medicine as a whole including, but not confining itself to, decisionmaking (Weston & Brown, 1995). Its origin lies in the theory that incorporating patients' subjective experience of disease into clinical practice is an essential element of good medicine (Laine & Davidoff, 1996). Out of six defined interactive components of the patient-centred process only some elements, such as "finding common ground regarding management" and "exploration of the disease and patient's illness experience", are directly related to decision-making between the doctor and patient (Weston & Brown, 1995). These elements suggest the use of shared decision-making or interpretative decision-making, according to the patient's preference. Hence, for the purposes of this paper, we have included the models of shared and interpretative decision-making but not the broader concept of patient-centred medicine.

Similarly, the model of concordance promotes a whole approach to the doctor±patient encounter rather than solely an approach to decision-making about treatment (Royal Pharmaceutical Society of Great Britain & Merck, Sharp & Dohme, 1997). It shares with patient-centred medicine the assumption that the patient's experiences of illness need to be incorporated into the patient's care. According to the definition given in the foundation document, concordance is defined as "an agreement reached after negotiation between a patient and a healthcare professional that respects the beliefs and wishes of the patient in determining whether, when and how medicines are to be taken" (Royal Pharmaceutical Society & Merck, Sharp & Dohme, 1997). The authors regarded the concept as "a new approach to the prescribing and taking of medicines". This emphasis suggests that the concept focuses on that part of the consultation which deals with the prescribing and taking of medicines. However, the authors also see concordance as "an integral aspect and not a detachable component of the whole process of clinical care." (Here we should note that the model of concordance has been developed over time and many interpretations and amendments have been made to the original concept. It has thereby become increasingly difficult to identify the core components of the model. Hence our use of the foundation document).

The model of decision-making found in concordance is distinct from the shared decision-making model, both in the assertion that the patient's view should have precedence and because it allows for the patient to delegate the decision-making authority to the doctor (Pollock, Blenkinsopp, & Grime, 2002). (By contrast, in the shared decision-making model delegating the decision- making authority to another party is seen as actually falling outside shared decision-making). However whilst noting these important differences in emphasis we would suggest that the significance of concordance is understood purely in relation to its expression in decision-making the limitations of the three patient±doctor decision-making models that we are exploring in this paper apply equally to concordance.

It is widely acknowledged that these three models are idealisations and that practice rarely reflects only a single model used in its idealised form (Charles et al., 1999b). There are arguably three reasons for this 'gap' between models and practice. Firstly, there are approaches which fall, so-to-speak, in intermediate positions between these models or, to put it another way, it is possible to combine elements from various models in one decision-making process. Secondly, the question of which model is most relevant to practice might best be thought of not as a universal question but as one which depends on the clinical circumstances, and on the doctor's and patient's preferences and knowledge at specific times and places, amongst

other things. For example, in an emergency situation the paternalistic model has been advocated (Emanuel & Emanuel, 1992). Thirdly, however, and most fundamentally as we have mentioned already in the introduction, it is not always easy to identify what would count as an application of a model in practice. In particular, the models reflect different sets of assumptions about practice: different assumptions about what the respective roles of doctors and patients are; or different assumptions about what they ought to be, (depending, that is, on whether we stress their descriptive or their prescriptive functions).

What, then, are these assumptions? The interpretative model, for example, assumes that first, the doctor needs to make the decision since he/she has the duty to act in the best interest of the patient and second, that the patient is not able to make a decision due to his/her illness and lack of information and knowledge. By contrast, the informed model assumes that only the patient is able and should decide which kind of health care he or she should receive (Emanuel & Emanuel, 1992). Shared decision-making assumes that the patient is not necessarily able to decide on his/ her own and therefore, it is the doctor's duty to support the patient's decision-making (Charles et al., 1997, 1999a, b). This can be achieved by drawing out the patient's preferences and values, discussing each other's preferences and agreeing on the decision made. Hence the responsibility for the decision is shared.

In essence, the decision-making models differ in their understanding of first, the proper scope of patient autonomy and second, the duties and responsibilities of doctors. First, with regard to patient autonomy, some of the models operate with 'thicker' conceptions of autonomy. For example, shared decision-making suggests that decision-autonomy depends upon an environment of communication and reflection and is, as Emanuel and Emanuel (1992) put it, a "process of moral deliberation". In contrast, the interpretative model and the informed decision-making model tend to reflect a dichotomous picture of autonomy which is either present or absence. Here the values are known to the actors and there is less emphasis on reflection and revision. Second, in terms of the responsibility of the doctor, shared decision-making emphasises the duty and responsibility of the doctor to elicit values, preferences or beliefs and to discuss how these may apply to the treatment decision; the paternalistic and the informed decision-making models exempt the doctor from this task. In these cases, as well as in the case of interpretative decision-making, the actual process of decision-making is with the doctor or the patient, which means that the weighing of options does not need to be verbalised and thus this process need not be an interactive one: indeed, the final decision can be made outside the patient±doctor encounter.

Although we will return to this idea towards the end of the paper we should underline here that these sets of assumptions are closely linked to fundamental questions of professional ethics i.e. they embody different conceptions of the obligations of doctors, different ideas about the ideal forms of professional comportment and patient± doctor relationship structures and different ideas about the proper (and relative) scope of doctor and patient powers and responsibilities. Hence, whether we are using models predominantly prescriptively or descriptively, in using them we are, inevitably, drawing on some background picture of professional ethics.

Limitations of the decision-making models

What are the relationships between these models and clinical realities? As we have noted earlier it does not make sense to look for complete or tidy matches between the two. However, in analysing the decisionmaking models we found two substantial limitations which, we suggest, means that the use of these models for understanding doctor±patient decision-making within the consultation needs to be questioned and re-evaluated. These limitations also shed light on the reasons *why* models such as shared decision-making are not widely implemented in practice.

The framing problem—i.e. the construction of the option-set for decision-making is neglected

The decision-making models neglect an important condition of treatment decision-making: i.e. how is the option-set from within which the final treatment decision is made constructed? That is, how do doctors and patients discover or determine the range of treatment possibilities from which they are making a choice? In practice, this will very often come down to the question of whether patients are 'offered' a range of treatment options. All the models focus on the opportunity to engage in the final selection of treatment and overlook the fact that the number of treatment alternatives considered significantly influences the degree of autonomy exercised. Recent studies investigating how far the models of shared decision-making and informed consent are implemented in practice show that explicitly mentioning treatment options is often neglected

in the doctor±patient consultation (Braddock, Edwards, Hasenberg, Laidley, & Levinson, 1999; Gattellari, Voigt, Butow & Tattersall, 2002; Elwyn et al., 2001b). These observational studies, analysing audio-tapes from consultations, assessed not only whether the patient was asked for his/her choice (final authorisation), but they also investigated if the patient was explicitly offered one or more treatment alternatives. In oncology consultations Gattellari et al. (2002) found that less than one in two (44%) patients was offered one or more treatment alternatives. Braddock et al. (1999), analysing primary care consultation and consultations between patients and surgeons, reported that only around one in ten patients (11%) were offered alternatives. Perhaps most significantly, by measuring the time spent in the primary care consultation on various elements of shared decision-making Elwyn et al. (2001b) found that doctors spent the least time on explicitly mentioning the existence of equally reasonable treatment alternatives. This shows that not only do the models not represent the question of the range of treatment options offered to the patient, but also that in practice this element of the decision-making process is frequently neglected.

Why does the question of the option-set receive such little attention both in the decision-making models and in practice? The range of treatment options available to, or offered by, the doctor are likely to fall within a professionally agreed range i.e. what some authors call 'medical reasonable alternatives' (Whitney, 2003). This range is determined by a number of factors (see Fig. 2): policies, the doctors' concept of duty and responsibility, the knowledge (and assumptions) of the doctor about the patient's values and preference (Britten, Stevenson, Barry, Barber, & Bradley, 2000), the doctors' knowledge about the medical treatments available for a specific diagnosis, medical information about the treatment options, organisational constraints (time, costs, etc.) and maintaining a relationship.

We will briefly discuss some of the factors influencing the option-set in order to analyse their impact on the real scope of decision-making on offer to the patient. Policies are probably the most commonly discussed factor here (Sculpher, Gafni, & Watt, 2002). Health care providers can significantly limit the range of treatment alternatives, for instance through excluding treatments from reimbursement. The limitation of choice at various levels of the health care system could be pictured as a funnel with various levels of filters. Examples would be the licensing of the medicine, its inclusion in the national reimbursement mechanism, national prescribing policy, local health authority policy, then hospital or GP practice formulary and policies. On each level of the funnel the choices can be reduced. One reason *why* patients are only offered one treatment option can be the effect of policies that reduce the range to a single treatment. In these instances neither the doctor nor the patient may have much direct say in the construction of the option-set. Nonetheless, even in these cases doctors who wish to 'involve' patients in decisions about their treatment are presented with communication dilemmas.

Thus, for example, Sculpher et al. (2002) discuss the actual practicality of shared decision-making in a publicly funded health care system where conflicts between the choice of 'optimal' care and funded health care might occur. Doctors may similarly experience dilemmas in providing

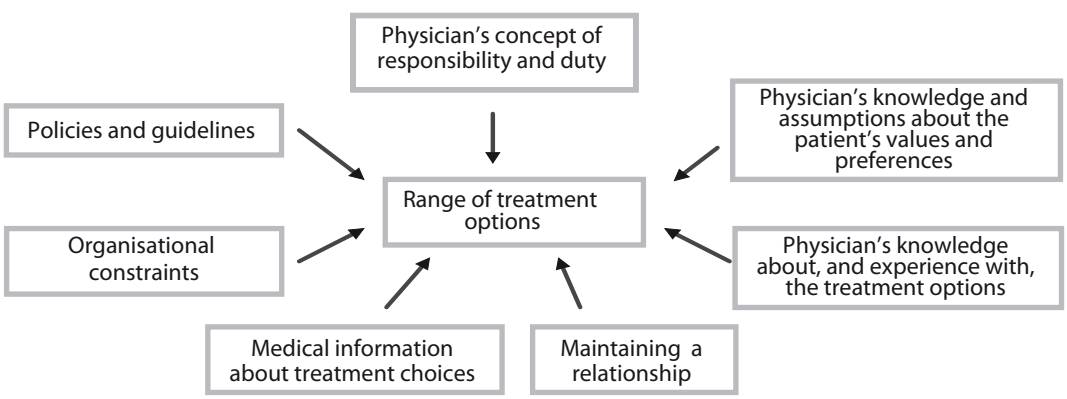

Figure 2. Factors influencing range of treatment options offered.

care, which takes account both of patients' wishes and of the conceptions of cost-effective treatment set out in the health care provider guidelines. Sculpher et al. (2002) suggest that distinctions should be made between (i) clinical guidelines, which focus on the range of treatment alternatives, and their respective benefits and risks, (ii) system guidelines, which are issued by the health care organisation and focus on costeffectiveness and finally (iii) treatment options those things that the health care provider funds. They argue that making these distinctions would reduce conflict in the doctor±patient relationship but it could just as well be argued that acknowledging these complications merely multiplies the dilemmas in balancing professional responsibility with information-sharing and patient autonomy.

The other factors that influence the option-set are less well-explored. For instance, it is less clear how far a lack of doctors' knowledge about treatment options causes restriction in the choice of patients' treatment in practice. If doctors are not aware of certain treatment options they cannot initiate a discussion about them with, or offer them to, patients. Equally, doctors might be aware of options but have limited knowledge, expertise or experience of using the option, making it difficult to offer confident advice to patients. In either of these cases it is of course possible, in principle, for the patient to initiate discussions about a wider optionset but (a) given the typical social positions of doctors and patients in relation to clinical knowledge and policy influence, it is likely to be the case that patients generally have less role in the construction of the option-set and (b) even where patients are influential in this respect (perhaps by presenting an option found on the internet) there is obviously a limit to how far doctors can helpfully support patient choice in areas where the doctors themselves lack relevant expertise.

The significance of this problem about the construction of the option-set depends in large part upon one's beliefs about the doctor's professional responsibility. The difference of opinion about when shared decision- making can or should be practiced stems from conflicting accounts of doctors' responsibility in relation to 'steering' treatment choice. Ford, Schofield and Hope (2003), interviewing a group of doctors, other health care professionals and lay people, found two conflicting opinions in play. One opinion was that involvement of the patient in the decision was only legitimate in a situation of equipoise (the existence of two or more treatment options including the 'no treatment option', without particular professional preference for one option); another opinion was that it should always be practiced. On this basis Trevena and Barratt (2003) suggested a compound model of 'integrated decision-making', which makes explicit that the locus of decision-making shifts depending on the case in hand. Thus at one end of the spectrum only the patient decides. At the other end only the doctor decides (in situations where the community values override the patient's right of autonomous action). But in cases of equally effective options the patient and doctor decide together. Similarly, Whitney (2003) argues that shared decision-making should only be practiced where there is a 'medical reasonable alternative'.

Models of shared decision-making do not define the extent to which the option-set needs to be jointly constructed by patients and doctors. If patient involvement has a value, there is no absolute reason *why* it should have a role only *after* the construction of the option-set. We are happy to acknowledge that calling for an equal role for doctors and patients in the construction of the option-set would be somewhat other- worldly but it is nonetheless important to question models of patient involvement that do not systematically address this issue. What we are left with are some fundamental ambiguities. For example, accounts of shared decision-making suggest that doctors need to take patient views and beliefs into consideration when proposing treatment alternatives (Charles et al., 1999a). Charles et al. (1997) argue that this means in certain cases, a doctor might mention treatment options and then agree to the patient's preference for them even when these would not be the doctor's choice of treatment for the patient. In some cases this may well be what is entailed by shared decision-making but it is very difficult to decide how to draw boundaries around this possibility. How far should doctors allow patients to set the treatment agenda? This is an example of the 'interpretative gap' we referred to above. But this is not merely an abstract problem about model conceptualisation. It is a critical ethical dilemma in a world where doctors are, and are held, accountable for the treatments their patients take up.

The nature of reasoning problem—i.e. the nature of the reasoning-communication that makes up decision-making is neglected

Another important limitation of these models is the absence of any detailed account of how doctor and patient should embark on a deliberation that involves a discussion about values, preferences and beliefs and the making of a (sometimes) joint decision. The intended process

of dialogue and deliberation has not been described in much detail (Elwyn et al., 2001a; Charavel, Bremond, Moumjid-Fredjaoui, Mignotte, & Carrere, 2001). It is typically described with short 'umbrella' phrases such as "mutual discussion" or "negotiation", etc. A literature review on instruments measuring patient-involvement in shared decision-making found no single instrument which was developed to measure specifically the 'involvement' of patients (Elwyn et al., 2001a). The authors concluded that not enough attention has been paid to defining the assessment of the process of involvement. Recently, the OPTION scale has been developed in order to enable assessment of the process of involvement (Elwyn et al., 2003). Elements such as "the clinician explores the patient's expectations (or ideas) about how the problem (s) are to be managed" and "the clinician explores the patient's concerns (fears) about how the problem (s) are to be managed" have been included. Although the OPTION scale gives a more detailed account of what might be viewed as the essential elements of a joint decision, it does not capture the full process of dialogue and deliberation±a process which involves a number of *balancing acts*, as we discuss below.

When the full process of dialogue and deliberation is neglected there is the danger that in practice, choosing a treatment gets reduced to a largely technical task (Cribb & Barber, 1997). One indication that this happens in practice is the widespread expectation on the part of patients that the doctor is the expert at choosing the 'right' treatment (Coulter, 1999). Lying behind this expectation is a concept of prescribing, where the task is seen as similar to solving a mathematical problem. The person familiar with the rules can calculate the right answer to the problem. This model of treatment choice not only neglects patient-relative factors (values, lifestyles, preferences, etc.) but also pays insufficient regard to the uncertainties which are present in any treatment choice. As discussed earlier, only one of the factors influencing the range of treatment options offered is a 'technical' one, what we called 'medical information about the treatment', including benefits and risks (see Fig. 2). To the extent that health policy and health encounters reinforce the perception that choice of treatment is essentially a technical task, patients remain unaware of the full range of factors which influence the range of treatment options, the uncertainties inherent in clinical reasoning and the full potential for their involvement in decision-making.

Even 'medical information', which does rely on technical and expert knowledge, is limited in its application to an individual patient, as medical information is gained from cohorts of patients, and presented in relation to the effects on a population. Probabilities are not necessarily valid on an individual level (Bellaby, 2000). Prescribing largely involves 'trial and error'. The real effects of a given treatment to a given patient cannot be predicted with complete accuracy; they can only be gained from observation. In hospital, observation is done under medical surveillance. In primary care, patients themselves report about treatment effects. This 'trial and error' approach is used because first, there is no certainty about the effect at an individual level, and second, the large majority of side effects are reversible, so that the risk of this approach seems to be acceptable from the doctor's perspective. But the extent to which patients are aware of this underlying approach n approach at the heart of the clinical decision-making processes they are, in varying degrees, 'involved' in far from clear. Without at least a shared understanding of the 'rules of the game', here the actual potential for meaningful involvement is limited.

However, this only represents one respect in which the absence of a clearer picture, within the models reviewed, of the intended forms of reasoning±communication is unfortunate. Communication is an intrinsic feature of healthcare. That is to say that communication ere between doctor and patient *is part* of care, not just an instrumental support to care. Talk between doctors and patients can play a therapeutic role and the consultation is, or can be, a meeting place in which the meanings of patient experiences, and their hopes, fears and expectations are jointly unravelled and explored (Benaroyo & Widdershoven, 2004). It is only within this context that the role of patient involvement and potential for joint decision-making can be fully appreciated. However, this entails some acknowledgement within any proposed model not only of the potentially crucial relevance of patient's values and preferences, and of the possible means of eliciting these within dialogue, but also of the many inherent balancing acts in doctor±patient dialogue. Specifically, there are the *balances* between the calls upon doctors (a) to guide and support therapeutic communication including, where appropriate, helping 'contain' or respond to anxiety or other emotions, (b) to 'make space' for patients to share responsibility to some degree (including responsibility for treatment decisions or even decision-framing), (c) to inform or educate patients about relevant aspects of technical judgement and uncertainty and (d) to help elicit the relevant preferences of patients and to help ensure that these are adequately incorporated into treatment decisions. In

this extraordinarily complex scenario references to 'mutual discussion' or 'negotiation' obscure far more than they clarify.

Concluding discussion

These models, we have argued, fall short because they give insufficient attention both to *which* decisions are in the lens (the framing problem) and to the question of *how* decisions should be made (the nature of reasoning problem). Because these are two such fundamental considerations it seems to us that any useful model will have to address them more directly. However we would also want to argue that the task of addressing these questions entails facing up to fundamental dilemmas about the nature of professional±patient relationships that the models largely skirt around. Patient involvement is, we agree, rightly advocated for both instrumental and intrinsic reasons and as a necessary corrective to purely paternalistic models of decisionmaking. However, patient involvement cannot really be meaningfully considered without asking careful and detailed questions about how it is supposed to 'fit together' with expert or professional involvement. Professional involvement is the assumed background condition against which talk of patient involvement makes sense. It is important to bring patient involvement into the picture but in so doing we cannot overlook the fact that there is also a broader frame that is essentially made up of policy and professional judgements. (One of us has expressed this idea elsewhere by noting that the idea of 'person-centredness' is inherently and necessarily 'professionally centred' (Cribb, 2005); i.e. it could only arise and make sense in a context where professionals are being addressed and being asked to modify their orientation to some degree). Hence the two issues we have highlighted he question of which decisions are 'left to' patients, and the question of what might be seen as the choreography of some degree of 'joint' decision-making. How, in a nutshell, are the patient pieces and the non-patient pieces of this puzzle meant to fit together?

As we have already signalled, it seems that answering this question nd hence also evaluating the three models we have reviewed ep ends upon making discriminations between different conceptions of professional ethics. This is because lying in the background of the models are different accounts of professional obligations, ideals of professional comportment, patient± doctor relationship structures and of the appropriate scope of doctor and patient powers and responsibilities. We suggest, therefore, that these issues of professional ethics need to be addressed explicitly and systematically within the development or use of potential models. The core issue, we would argue, is the construction of an account of decision-making which recognises the ways in which professional decisionmaking is bound up with complex networks of accountability, and yet which also recognises the full importance of patient involvement in decision-making. It is, we suggest, the fact that professionals are accountable to policy communities, institutions, professional bodies and specific and general populations that explains the centrality of their role in both theoretical and empirical accounts of decision-making, including the relative paucity of evidence for shared decisionmaking in practice. There is no 'cost free' way of making unqualified affirmations about *both* professional accountability *and* patient involvement. In practice different balances have to be struck and although advocates of various models may want to strike balances with different emphases they must, we are arguing, be prepared to explain how they see these two things fitting together. Indeed, we would argue that the fundamental limitation of models of patient involvement is not as is sometimes assumed he potential difference between professional expertise and lay expertise, but rather the deep seated ethical and legal differences between professional and lay patterns of accountability. Our guiding thought here should not be read as antipathetic to more extensive patient involvement n principle, revision to shared decision models could go in either direction, depending upon the values of the health policy and/or the case in hand. Revisions could set out more explicitly the limits to patient involvement given the many other demands on the policy±professional nexus. Or they could, at least in some cases, explicitly increase the accountability of patients for their choices (and diminish that of professionals) .g. by requiring patients to forego rights of complaint or of legal action, where they choose options that are not professionally recommended.[1] Taking models of patient

[1] The American College of Obstetricians and Gynecologists have issued a statement which allows professionals to perform a caesarean section on request in certain circumstances (informed consent of the woman, the c-section not adversely affecting the health of the child and the mother) (Hannah, 2004). This illustrates that in a situation of potential professional dilemma (vaginal birth medically indicated from the point of view of the professional versus c-section requested by the patient) a professional organisation can set out ethical standards which serve as the frame for the construction of the option-set. In a public funded health care service such as the UK NHS the choice of a c-section on demand might be restricted due to reasons of cost containment (i.e. the policy sets the frame).

decisionmaking down either or both of these lines raises many complications and controversies. However, our argument is that to do so will only be shedding light on complications and controversies that are always present but often obscured.

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The status of diabetes care in Mexican population: Are we making a difference? Results of the National Health and Nutrition Survey 2006*

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The growing pandemic of diabetes and its complications has been recognized as the greatest challenge for all health care systems in the world. Most indicators, strongly point towards a further increment in demand and utilization of healthcare resources, with the consequent significant increase in the already staggering costs associated to the care of these pathologies.[1]

In Mexico, a particularly ominous scenario is occurring; diabetes prevalence has increased to a worrisome 14.3% of the adult population. Simultaneously, diabetes is the number one cause of death in the country.[2-3] This means that despite a very high lethality, the disease is getting more prevalent. Among the possible interpretations of these facts, is that the incidence of diabetes is increasing at such a high rate that, despite the very significant mortality, the prevalence remains increasing. Regardless of the explanation(s) of this serious circumstance, the situation is imposing an enormous strain on the national health care system. Moreover, there is evidence to support that diabetes and its chronic complications, generate the most significant costs of the entire health care expenditure.4 There is a strong need for more information in order to implement strategies to contain the epidemic and handle its consequences by investing wisely in strategies that need to be evaluated constantly.

The therapeutic armamentarium to deal with diabetes and associated risk factors, at the clinical level has increased over the past decades, so its costs. The Mexican health care systems dedicate substantial resources to this matter. However, there are few indicators of the effectiveness of this strategy. The information available alerts about an ineffective performance of the system.[5] This finding has been a subject of concern in different countries because in general, the operation of the health care system tends to yield relatively poor outcomes at considerable costs.[6]

In most situations that explore the efficacy of the system in dealing with diabetes, the attention has been focused in the process of care, not in the outcome of the specific process.[7-8] Clearly this approach measures performance in compliance with specific recommendations or guidelines. The behavior displayed by the provider, most likely a physician, is assessed by comparing it, with respect to a specific reference, counting the times in which the "correct" therapeutic maneuver is performed/indicated. This has been called "quality of care". Some of the accepted therapeutic guidelines have been created to facilitate and increase the translation of good evidence based information to the care of the patient. Most of these guidelines are well developed documents that compile evidence based information and

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translate it, into recommended therapeutic maneuvers. It is very important to keep in mind that the availability of resources at the local clinic modulates the plausibility of a particular recommendation. Hence, it is not enough to have the evidence and with ideal plan, its implementation has to be done realistically in the clinical setting.

We have examined a series of clinical indicators that allows a perspective of the status of the care of patients with diabetes in Mexico. The indicators were selected because it's clinical importance.

Materials and Methods

The design, methods and procedures of the National Health and Nutrition Survey 2006 (ENSANUT 2006) has been described elsewhere.[2] Briefly, with a probabilistic multistage stratified cluster sampling design aimed to have a national and state level representative sample, a total of 45 446 adults aged 20 years or more were examined, a questionnaire, blood pressure and anthropometric measurements were included. Blood samples were collected from 30% of a randomly selected adults, most of them (91.3%) with more than 8 hours of fasting. Serum samples were frozen at -70 ° C for future analysis. From the frozen serum bank, a sub-sample of 6 613 participants was randomly chosen to determine glucose, insulin, triglycerides, total cholesterol, HDL-cholesterol and HbA1c (in diabetic subjects).

For these analysis we concentrated on adults who self reported a previous diagnosis of diabetes established by a physician and responded affirmatively that they receive medical treatment, either from the entire survey (n=2 644 diabetics) or from the biological sub sample with metabolic biomarkers information and with fasting of at least 8 hrs. (n= 428).

The protocol was approved by the Ethical Committee of the Instituto Nacional de Salud Pública. All patients signed informed consent.

Variables definition

The diagnosis of diabetes was accepted when the participant declared he /she was diagnosed by a physician and was under treatment. The duration of disease as well as the specific treatment was registered. Responses were accepted without confirmation.

The diagnosis of hypertension was accepted when the participant declared he/she was diagnosed by a physician as hypertensive and declared he or she was taking prescribed antihypertensive medicines, regardless of the blood pressure level. Access to health care was determined by asking the subject if he or she had medical insurance and to specify which kind. No attempt was made to confirm participant's response by requesting official documentation of the health care provider. Previous health care access was not ascertained. Health Care System is composed of the following institutions: Instituto Mexicano del Seguro Social (IMSS), the Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado (ISSSTE), the recently developed Seguro Popular (SP) hereby Popular Security, the health services administered by the federal government and those administered locally by each state (classified within "Other" category) and the private health care sector (named "Private") During the interview, participants were asked if they identified themselves as indigenous and if they spoke an aboriginal dialect. The response was accepted without confirmation. The years of study were also taken as they were reported by the participant. Body mass index was calculated using the standard formula. Laboratory measurements were performed using the methods that are described in other papers published in this journal. The biomarkers levels were categorized to evaluate the proportion of diabetic subjects in adequate control using the cutoff points defined by the Mexican and international guidelines. Participants answers to questions regarding preventive measures in their care, such as ophthalmologic and feet exam, renal evaluation or aspirin preventive treatment, were recorded, no chart review or confirmatory methods were attempted.

Analysis

Given our focus on medical care all descriptive analysis were stratified according to the institution where the diabetic patient reported to receive their medical care. We describe a set of variables that are related to the quality of care. For those indicators that do not need biomarker measurements (process of care) we used the entire sample of diabetics from the survey (2 644) and for biomarker indicators (intermediate outcomes) we used only the diabetics from the biological subsample (428).All biomarkers were measured at the Instituto Nacional de Salud Pública. We estimated the proportion or means of each variable taking into account the sampling weights and considered the survey's complex sampling design to obtain variances. Statistical analysis was performed using a commercial package. Standard statistical procedures were performed using this platform.

Results

Table I shows the characteristics of the patient population with respect to access to health care. There are five categories including the group of subjects that declared that had no health care insurance. The number of participants for each category ranged from 91 to 1 188. The largest group with access to care was encompassed within the two major providers in the system (IMSS and ISSSTE). The smallest group designed as "other" included 91 subjects. This group includes several smaller insurance affiliated subjects. It is of particular interest to mention that 677 participants responded that they had no access to care and 73.4% of this group were females; this group had the

Table I. Some clinical and social characteristics of subjects with self reported diagnosis of diabetes with respect to access to health care. Mexico, ENSANUT 2006

	IMSS/ISSSTE n=1 188	Popular Security N=200	None n=677	Other n=91	Private n=488
Female	50.7 (50.5,50.9)	80.4 (80.0,80.8)	73.4 (73.2, 73.7)	79.8 (79.0, 80.5)	56.3 (56.0,56.5)
Age(years) mean(95%CI)	56.9 (53.4,60.4)	52.6 (47.6,57.6)	55.6 (52.1, 59.0)	60.7 (46.3, 75.2)	55.8 (52.6,58.9)
Education					
None or basic	8.26 (68.0, 68.4)	90.7 (90.4, 91.0)	85.8 (85.6, 86.0)	98.9 (98.7, 98.1)	68.9 (68.7,69.2)
Medium	24.2 (24.0, 24.4)	9.2 (8.9, 9.5)	11.5 (11.3, 11.7)	1.0 (0.8, 1.2)	19.1 (18.9,19.3)
Superior	7.4 (7.3, 7.5)	0 (0,0)	2.6 (2.5, 2.7)	0 (0,0)	11.8 (11.6,12.0)
Population					
Speak aboriginal dialect	3.0 (2.9,3.0)	9.0 (8.7,9.3)	10.7 (10.5, 10.9)	0 (0,0)	1.5 (1.4, 1.5)
Does not speak aboriginal dialect	16.4 (16.2,16.6)	2.6 (2.4,2.7)	13.3 (13.1, 13.5)	8.4 (7.8, 7.9)	21.2 (21.0, 21.4)
Non Aboriginal	80.5 (80.3,80.6)	88.3 (87.9, 88.6)	75.9 (75.6, 76.1)	91.5 (91.0, 92.1)	77.2 (77.0, 77.4)
Rural population	5.4 (5.3,5.5)	28.9 (28.5, 29.4)	41.8 (41.5, 42.0)	21.0 (20.2, 21.8)	15.0 (14.8, 15.1)
Urban population	94.5 (94.4,94.6)	71.0 (70.5, 71.4)	58.1 (57.9, 58.4)	78.9 (78.1, 79.7)	85.0 (84.8, 85.1)
BMI kg/m²					
< 25	9.0 (8.8, 9.1)	29.2 (28.7, 29.6)	25.0 (24.7, 25.2)	21.2 (20.4, 22.0)	21.6 (21.4, 21.8)
25-29	43.0 (42.8, 43.2)	21.7 (21.3, 22.2)	43.8 (43.5, 44.1)	13.3 (12.6, 13.9)	57.1 (56.8, 57.3)
≥30	47.9 (47.7, 48.1)	49.0 (48.4, 49.5)	31.1 (30.8, 31.3)	65.4 (64.4, 66.3)	21.2 (21.0, 21.4)
Previous diagnosis of hypertension. Controlled (SIS <135 / DIA <85)	20.4 (20.3, 20.6)	1.6 (1.5, 1.8)	15.0 (14.8, 15.2)	22.6 (21.8, 23.5)	8.6 (8.5, 8.8)
Previous diagnosis hypertension. Uncontrolled (SIS ≥135 / DIA ≥85)	8.2 (8.1, 8.3)	14.1 (13.7, 14.4)	14.6 (14.4, 14.8)	21.2 (20.3, 22.0)	11.4 (11.3, 11.6)
Without diagnosis probable hypertension (SIS ≥140 / DIA ≥90)	6.4 (6.3, 6.5)	9.5 (9.1, 9.8)	10.4 (10.2, 10.6)	6.2 (5.8, 6.7)	17.3 (17.1, 17.5)

Data are percentages and 95% confidence intervals, unless otherwise indicated

highest proportion of subjects that reported to be able to speak an aboriginal dialect and the highest representation of subjects living in rural communities. An outstanding finding was that the subjects that reported having access to care from private insurance, had a prevalence of obesity of 21.2% (BMI ≥ 30). Remarkably, this high figure is substantially lower than the observed in the other groups. The other groups had obesity prevalence that ranged from 31.1 to 65.4% (confirming the previously reported high prevalence of obesity as a cardiovascular risk factor).[9]

Of great significance is the predominance of the group without or only basic education, in all the categories of health care service. As expected, the group with private health care service had the largest proportion of individuals with higher education, followed by the group that reported having insurance by the largest providers (11.8 and 7.4% respectively). None of the participants that reported having health care insurance at the "Popular Security" and by "other systems" had higher education. Surprisingly up to 2.6% of participants that reported no health insurance had higher education.

The proportion of individuals reported to be hypertensives and, with good control according to international guidelines ranged from 1.6 to 22.6 % and those with inadequate control ranged from 8.2 to 21.2%. Perhaps this finding is influenced by the nature of self reported data. We do recognize a high prevalence of hypertension in Mexican population. There is a significant group without previous diagnosis of hypertension, but with high systolic and diastolic measures that ranged from 6.2 to 17.3%. It is necessary to reassess the prevalence of hypertension in lieu of, not only of newer diagnostic criteria but also for comparisons of prevalence of hypertension with other populations.[10-11]

Table II shows the variables that can be used to assess the characteristics of this patient population. Most of the patients of this population are within the age range of 30-60 years. About 22% of the subjects had less than 2 years of duration of the disease. More than half of the entire diabetic population has more than 4 years of duration of the disease. The peak of onset of disease occurs at the ages between 30-60 years. A substantial proportion of individuals are diagnosed at either end of the spectrum, younger and older. Regarding therapy, the majority (85.6%) are treated with oral agents. A significant proportion of patients (6.2%) reported not using therapy. The proportion of individuals using insulin as a single therapeutic agent or in combination with oral agents is small.

For Table III we used only the diabetics from the biological subsample (428), it shows the biomarker indicators (intermediate outcomes) associated to the assessment of control. The proportion of individuals that had total cholesterol higher than 200 mg/dl is noticeable in all groups. Even in the group "Other" in spite of the small number of cases, the number of subjects with hypercholesterolemia is high (more than 36%).The proportion of subjects with low levels of HDL cholesterol is of significant concern. Almost 76% of the entire group had levels of HDL below 40mg/dl. In addition it should be noted that a significant number of subjects have triglycerides (TG) above 150 mg/dl. Of the entire group 35.5% had values beyond this cut-off point. This lipid pattern: low HDL-high TG has previously been reported in Mexican population[12-13] and has been attributed mostly to the high carbohydrate content, characteristic of Mexican diet.[14]

The level of glycemic control, as judged by the values of glycohemoglobin (HbA1C), confirms a previously reported and worrisome finding.[15] Only a very minor fraction of the subjects have adequate mean glycemia. This is true in all health care groups. It should be noticed that the group reported having no health care insurance and presumably are not under clinical supervision, have similar values of mean HbA1C compared to all the other groups. The 84% of the entire subsample population are out of control and more than half (52%) of these had levels of glycohemoglobin above 12 percent.

Table IV shows the frequency with which the usual recommended therapeutic maneuvers are followed, to prevent or detect complications associated to diabetes, at each institution. Most of the participants (72.4%) reported that they were not referred for these evaluations. As should be noted it seems there is little difference between none and the different health insured institutions.

Discussion

The limitations and strengths associated to all surveys of this nature should always be kept in mind in order to properly assess the significance of the data.

Among the limitations is, that most of the diagnoses are based on self reported data: Diabetic & hypertensive status, treatment and duration. All were accepted without confirmation.

The major strengths of the survey is that the data represents a national scenario regarding chronic disease care. Including urban as well as rural population.

The private access group had a lower obesity prevalence (21.1%) compared with the other groups (31.1-65%). This fact does not imply causality. It might represent the

Table II. Some quality variables with respect to access to health care. Mexico, ENSANUT 2006

	IMSS/ISSSTE n=1 188	Popular Security n=200	None N=677	Other N=91	Private n=488
Diabetes diagnosis duration					
0 -2 years	27.9 (27.7, 28.1)	19.9 (19.5, 20.3)	23.6 (23.4, 23.8)	23.0 (22.2, 23.8)	19.5 (19.3, 19.7)
3-4 years	7.9 (7.8, 8.0)	37.2 (36.7, 37.8)	10.7 (10.5,10.9)	47.0 (46.0, 48.0)	19.6 (19.4, 19.8)
More 4 years	64.1 (63.9, 64.3)	42.7 (42.2, 43.2)	65.6 (65.3, 65.8)	29.9 29.0, 30.7)	60.7 (60.5, 60.9)
Age at diagnosis(years)					
< 30	6.2 (6.1, 6.3)	10.3 (9.9, 10.6)	9.6 (9.4,9.8)	9.8 (9.2, 10.4)	4.4 (4.3, 4.5)
30 to 44	32.0 (31.8, 32.2)	46.4 (45.9, 46.9)	37.6 (37.3, 37.9)	27.9 (27.1, 28.6)	40.6 (40.3, 40.8)
45 to 60	47.6 (47.4, 47.8)	28.8 (28.3, 29.3)	33.9 (33.6, 34.2)	9.5 (8.9, 10.0)	40.6 (40.4, 40.8)
> 60	14.0 (13.9, 14.2)	14.4 (14.0, 14.7)	18.7 (18.4, 18.9)	52.6 (51.6, 53.6)	14.2 (14.1, 14.4)
Treatment status					
Insulin	4.8 (4.7, 4.9)	2.7 (2.5, 2.9)	11.8 (11.6, 11.9)	9.8 (9.2, 10.4)	2.7 (2.6, 2.8)
Oral agents	82.2 (82.., 82.4)	91.2 (90.9,91.5)	73.9 (73.7, 74.2)	90.1 89.5, 90.7)	91.0 (90.9, 91.1)
Oral agents and insulin	5.1 (5.0, 5.2)	0.8 (0.7, 0.9)	0.8 (0.7, 0.8)	0 (0, 0)	1.1 (1.0, 1.1)
None	7.7 (7.6, 7.8)	5.1 (4.9, 5.3)	13.4 (13.2, 13.6)	0 (0, 0)	5.0 (4.9, 5.1)
Patients with glucose exams (venous samples)	32.2 (32.0, 32.4)	8.0 (7.7, 8.3)	29.1 (28.8, 29.3)	21.9 (21.1, 22.7)	30.6 (30.4, 30.8)
Patients with glucose exams (capillary samples)	59.8 (59.6,60.0)	76.1 (75.6, 76.5)	62.4 (62.1, 62.7)	78.0 77.2, 78.8)	60.4 (60.2, 60.7)
Patients with no lab exams	7.9 (7.7, 8.0)	15.8 (15.4, 16.2)	8.4 (8.2, 8.5)	0 (0.0)	8.8 (8.7, 8.9)

Data are in percentages and 95% confidence intervals unless otherwise indicated.

well known fact that obesity is associated to socioeconomic and educational status. This consideration is supported by the finding that this group has largest proportion of individuals with higher education, followed by the group that reported having insurance by the largest providers.

Of the various findings in this survey, perhaps the most appalling and urgent, is the set of results that represent the suboptimal efficacy of the current therapeutic model used in handling the challenge that represents diabetes care in Mexico. This issue was raised several years ago.[15] In other health care systems, in other countries, this finding has been identified as well, albeit local idiosyncrasies.[16] More recently, the question has been revisited in numerous forms, with even greater clamor. This is not be a surprise since, it is well established the salutary effects of good metabolic control in the prevention of microangiopathic outcomes secondary to poorly controlled DM, hence the pursuit of optimal metabolic balance. It is well recognized, that the costs associated to diabetes care are very significant, for Mexico and now this pathology is the single most costly disease.[6]

We are confirming a previously reported finding, this time, with nationwide representation of the entire health care system and several years later. Moreover, in the previously published papers in Mexico related to this area (diabetes care and complications), despite the fact that the

Table III. Indicators of Metabolic Control of Diabetic Patients (with laboratory information) with respect to access to health care. Mexico, ENSANUT 2006

Subjects with:	IMSS/ISSSTE n= 164	Popular Security n= 40	None n= 119	Other n= 11	Private N= 94
Cholesterol ≥ 200mg/dl	34.8 (34.8, 34.9)	82.1 (81.9 82.2)	39.5 (39.4, 39.6)	36.6 (33.2 34.0)	46.0 (45.9, 46.1)
HDL-C<40 mg /dl	76.9 (76.8, 77.0)	88.9 (88.8, 89.0)	62.4 (62.3, 62.5)	85.2 (84.9, 85.5)	66.5 (66.4, 66.6)
LDL-C ≥ 100mg /dl	34.4 (34.3, 34.4)	67.0 (66.8, 67.2)	38.9 (38.8, 39.0)	30.9 (30.5, 31.2)	34.9 (34.8,35.0)
Non HDL-C ≥130mg/dl	66.6 (66.5, 66.7)	88.0 (87.9,88.1)	67.8 (67.7, 67.9)	42.7 (42.3, 43.1)	74.9 (74.8, 75.0)
Triglycerides ≥150mg/dl	43.1 (43.0,43.2)	17.2 (17.0,17.3)	34.7 (34.6, 34.9)	23.1 (22.7, 23.4)	59.4 (59.3,59.5)
HbA1c (%)					
< 7	1.2 (1.2, 1.2)	0.0 (0.0, 0.0)	2.4 (2.3, 2.4)	27.4 (26.5, 28.3)	2.3 (2.2, 2.3)
7 - 7.9	16.2 (16.2, 16.3)	6.5 (6.4, 6.6)	8.9 (8.8, 9.0)	0 (0,0)	13.0 (12.9, 13.1)
8.0 - 11.9	44.7 (44.6, 44.8)	40.5 (40.3. 40.8)	45.3 (45.1, 45.4)	6.0 (5.6, 6.5)	24.2 (24.1, 24.3)
≥ 12	37.6 (37.5, 37.7)	52.8 (52.6, 53.1)	43.2 (43.1, 43.4)	66.5 (66.5, 67.4)	60.3 (60.2, 60.4)

Data are in percentages and 95% confidence intervals unless otherwise indicated

Table IV. Preventive measures to avoid complications with respect to access to health care. Mexico, ENSANUT 2006

	IMSS/ ISSSTE n=1 188	Popular Security n=200	None n=677	Other N=91	Private N=488
Ophthalmologic evaluation	7.4 (7.3,7.5)	14.0 (13.6, 14.4)	8.1 (7.9,8.2)	9.9 (9.4,10.5)	7.9 (7.7, 8.0)
Aspirin intake	6.0 (5.9, 6.1)	1.2 (1.0, 1.3)	1.5 (1.4,1.6)	3.1 (2.7,3.4)	4.2 (4.1, 4.3)
Feet evaluation	7.5 (7.3,7.6)	15.5 (15.1, 15.8)	12.4 (12..2, 12.6)	4.4 (4.0, 4.8)	15.4 (15.2,15.5))
Kidney evaluation	6.0 (5.9, 6.1)	5.1 (4.8, 5.3)	3.0 (2.9, 3.1)	5.5 (5.0, 6.0)	9.5 (9.3, 9.6)
None	69.3 (69.1, 69.5)	62.8 (62.2, 63.3)	77.9 (77.7, 7.2)	85.1 (84.3, 85.7)	67.1 (66.8, 67.3)
Other	12.1 (12.0, 12.2)	13.8 (13.4, 14.1)	3.2 (3.1, 3.3)	10.7 (10.1, 11.3)	11.4 (11.2, 11.5)

Data are in percentages and 95% confidence intervals unless otherwise indicated

patient population reported have poor metabolic control, this finding is not emphasized.[17-18]

The fact that, in this survey, we are reporting results of patients with and without access to care, gives us the opportunity to question the net effect in terms of outcome, of having or not having access to diabetes care. If we go even further and look for potential differences between institutions or with respect to public/private, we can conclude that a very substantial proportion of diabetic patients are in poor control, regardless of access to care, or type of institution, or private or public insurance. In fact it, this is the situation of the entire health care systems operating in Mexico. An important issue and needs to be underscored is the fact that participants were asked if they had access to care but not regarding previous access, this might be the reason *why* some individuals without access

were on insulin therapy or had glucose exams. Considering the reported costs estimates for Mexican health care system, the issue of inefficacy is even more pressing and signals the need of a significant change of paradigm. This situation has been found in other parts the world.

The data regarding hypertension prevalence and control is significant. It signals that the issue is overall cardiovascular risk, the small proportion of known hypertensives under appropriate hemodynamic control resembles the message that we see in diabetic subjects, that is, insufficient effectiveness.

The information in Table IV, regarding the adherence of the providers to suggested care model or guideline, is of interest in several ways. Firstly it seems that there are less than expected situations in which the recommended behavior, was followed. Second the situation appears to be occurring in a similar fashion in all the institutions that encompass the Mexican Health Care System. This finding may be an area of opportunity to address efforts in order to maximize the adherence to the process. However the situation also suggest that, by simply following the recommended steps established by guidelines, there is no guarantee the achievement of better metabolic control. What we do know is that, following the recommended steps at a guideline, there will be increments the costs of care. Therefore, it would seem unlikely to expect that the adherence to the recommendations will enhance the level of control.

The data summarized in this paper, gives the fourth element that adds onto the previous three that offers an apocalyptical scene: High prevalence, high lethality, high costs and high inefficiency. It seems likely that the described pattern, with some regional variants is occurring in other countries. This is indeed an area of opportunity for innovative research.

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Ambulatory health service users' experience of waiting time and expenditure and factors associated with the perception of low quality of care in Mexico*

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Health service users (HSUs) have a legitimate interest in the provision of health care with a high level of quality as they are financial contributors, tax paying citizens and recipients of care.[1] However, public health services, particularly in developing countries, struggle to provide not only a high technical quality of care but also responsiveness to non-medical expectations.[2,3] As a result many HSUs, particularly in developing countries, prefer using fee-for-service care with high out-of-pocket expenditures. Hence, studying perceptions of quality of care is critical to understanding health service utilization.

Because HSU perception of health services quality is a result of two principal factors: first, their experiences with access to care and use and second, the respective ratings or value they assign to these experiences, it has been argued that it is important to analyze both experiences and ratings simultaneously.[4-7] Reported experiences with access to health services include, among other aspects, transport time to the health service facility and the waiting time. Experiences with use include for example the physical examination by the physician, information provided by the health care professional to the user and the length of consultation. The ratings include, for instance, how long the HSU perceived the travel time to be, waiting time at the facility (e.g. long or very long) and how they rate the information they received (very adequate or adequate). Many previous studies in Latin America have focused only on patient's satisfaction (e.g. the % of patients satisfied with the waiting time) without taking into consideration the actual experience (e.g. length of waiting time) of access to and use of services.[8-11] The evaluation of patient's satisfaction does not necessarily mean measuring of patient's experiences as "satisfaction involves a cognitive evaluation of and emotional reaction to health care"[12] Hence, Coulter[7] has argued that that it is central to measure patients' experience in combination with their respective ratings. Information on both of these aspects is essential to improving quality in health services, as they can provide important reference points against which HSU experiences can be measured.

As in other Latin America countries, insufficient quality of services and user dissatisfaction with the public and social security services have been cited as two of the main reasons why people in Mexico opt to use fee-for-services despite its financial implications. The use of fee-for-services among insured and uninsured population has increased over the last years in Mexico. In 2000 31.1% used fee-for-service,[13] meanwhile in 2005 37.6% reported

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using them.[14] Fee-for-service care has been receiving the highest overall user satisfaction in recent years.[15,13] To tackle insufficient quality of care, over the last decades the Mexican government has launched various initiatives to improve quality of care. Since 2007, the Comprehensive Quality System (Sistema Integral de Calidad or SICalidad) has aimed at quality improvement in the public sector. To make providers more accountable, HSU satisfaction with quality of services is reported periodically. For instance, in 2006 an average of 98% of ambulatory care patients were satisfied with the information received from the physician and 89% with the prescription filling.[16] However, the data reported do not identify what experiences resulted in 11% of the HSUs reporting that they are not satisfied with their prescription filling (e.g. partial prescription filling, receiving no medicines or receiving inadequate information).

Previous studies on user satisfaction with the quality of care comparing different service providers in Mexico reported that the primary reasons for perceived low quality were long waiting times and poor clinical examination.[15] Other studies have focused on comparing interpersonal quality of care between different health care providers in Mexico, which found that ambulatory health service HSUs were most frequently unsatisfied with the waiting times whereas hospitalized health service HSUs most frequently mentioned limited choice of provider as the reason for dissatisfaction.[17] A recent study by Puig et al[18] focused on which health service user characteristics are associated with the perception of overall good quality of health care and found that age, health status and education were associated with the overall perception of health care quality. Although these studies provide insight into the reasons *why* HSUs perceived the overall quality as low[15,17] or *what HSU characteristics* influence the perception of good quality of care[18] they do not provide information on which HSU experiences specifically resulted in a low quality rating and therefore, need to be improved. In other words, to give some examples, we need to know the average waiting time a HSU would rate as acceptable and what choice of providers is most frequently rated acceptable. To improve health quality programs in Mexico and other countries this information is of high relevance. In addition, there is a paucity of information about which aspects of the experience of care most influenced the general perception of low quality when adjusting for patient characteristics. Such information would allow prioritizing in programs most relevant to HSUs. Therefore, the objectives of the present study were twofold: first to identify, on the bases of HSU experiences and their respective ratings of waiting time and expenditure on health care, reference points of acceptable quality and second, to analyze which HSU experiences are associated with a general perception of low health care quality.

Methods

The present study is based on an analysis of the most recent (2006) National Health and Nutrition Survey (ENSANUT) which has been carried out every six years since 1988 and explores the characteristics of household members in terms of health, physical activity, diet, chronic diseases and health service utilization.[19] The 2006 survey is a nationally representative, multistage, stratified sample of 47,152 households for which information was collected between October 2005 and May 2006.[19] (A rejection rate of approximately 15% has been taken into account when calculating the sample size.) For analysis purposes, information from the household and health ambulatory service utilization portion was used. In Mexico ambulatory health services (also called outpatient services) are defined as all diagnostic, curative and preventative services provided to individuals in and outside the hospital who depart after service delivery. This excludes hospital services (also called inpatient services) which are defined as those where individuals receive diagnostics or curative services and stay for longer than 24 hours at the service delivery site (clinic or hospital). The HSU experiences instrument of ENSANUT has been used in earlier national health services 1994 and 2000. A study testing for reliability and validity was carried out prior to their use.[15] The different aspects that the instruments include to analyze HSU experience are based on the literature of measuring quality of care.[20,21] A random sample of household members was asked in a face-to-face interview about health service utilization in the previous 14 days and their experiences and perception in access and use of health services.

HSUs were stratified according to the three main health care providers in Mexico: (1) Those attending Ministry of Health and related institutions (MOH) which comprises the Ministry of Health, Seguro Popular, Comprehensive Family Development Program, Red Cross, Civil Hospital, National Institutions, and the social program Oportunidades; (2) Social Security Institutions (SSI) including the Mexican Institute of Social Security (IMSS), the Institute of Social Security and Services of State Workers (ISSSTE), Military Services (MARINA/DEFENSA), and Mexican Petrol (PEMEX); and (3)

Private Institutions (PrivI). The MOH and affiliated institutions provide care to the uninsured population; the SSI provides care to formal sector employees and their families and the private sector offers services on a fee-for-service base.[22] To uninsured individuals, the MOH provides services free of charge only for hospitalized patients; medicines prescribed in ambulatory care (outpatient) are subsidized for uninsured individuals. Although according to regulations, fees are inversely related to patients' income,[22] in practice, it varies between and within states whether fees are applied or not. Recently the Ministry of Health has started to provide care for those affiliated with Seguro Popular, a new government program which offers basic health services to those who were previously uninsured.[23] Seguro Popular purchases services from different providers, in most Mexican states via the MOH. Those with Seguro Popular have the right to receive a defined list of services and essential medicines free at the point of care. In this context it is relevant to note that, although services at the SSI in Mexico are pre-paid and free of charge at the point of care, there are circumstances (e.g. lack of supply) in which HSUs of SSI do not obtain their medicines or laboratory tests at the institution. In these cases the HSUs have to pay for them using outside private pharmacies or clinical laboratories. In exceptional cases, patients who are not affiliated with SSI are offered care but they are charged for the received services.

Using HSU ratings of experiences in accessing and using health services, reference points of acceptable quality of care related to some aspects of care -namely travel and waiting time as well as expenditure- were developed. This process was conducted as follows: HSUs were asked to rate travel and waiting time ('very short', 'short', 'regular', 'long' and 'very long'), as well as expenditure on medicines, laboratory tests and consultation ('very cheap', 'cheap', 'regular' 'expensive' and 'too expensive'). The answers 'very short' and 'short' as well as 'cheap' and 'very cheap' were considered to indicate acceptable quality. Then the median travel and waiting time as well as median expenditure for medicines, laboratory tests and consultation reported as acceptable were calculated for each of the three institution types (MOH, SSI, and PrivI). These values were defined as reference points for acceptable quality of care and were compared against the reported time of travel, waiting and expenditure on medicines, laboratory tests and consultation for each type of institution.

Then we analyzed HSU experiences with aspects of quality of care. In order to permit more systematic reporting of these quality-related aspects we divided them into four areas: access, structure, process and outcome (adopted from Donabedian[20] who distinguished among structure, process and outcome) and from Anderson[21] whose work focuses on accessibility to health care. (i) Access includes HSU estimated travel time to the health facility; the estimated waiting time at the facility; expenditure on medicines, laboratory tests, and consultation (amount of expenditure reported in Mexican pesos); (ii) Structure comprises prescription filling, receiving laboratory tests and whether or not the HSU had to pay for the consultation (binary in yes or no); (iii) Process includes the estimated duration of consultation time and whether the HSU received a referral for laboratory tests and prescription for medicines; and (iv) Results including reported improvement in health status after service use.

Finally, we analyzed which HSU experiences resulted in an overall perception of low quality of care. We conducted a multivariable binominal logistic regression analysis with the rating of low quality of care being the dependent variable. Initially, overall perception of quality of care was measured on a scale from 1 to 5, where 1 was very high and 5 very low quality. For the purpose of this study the variable was dichotomized as low (3 to 5) with a value of 1 and high quality rating (1 and 2) with a value of zero. In a first step, we included in the model all variables reported in the literature as associated with low quality of care ratings.[5,24] In addition, those variables were also included which the authors on the basis of the questionnaire identified as relevant. The variables included were: socio-demographic characteristics of HSU (age, education, sex, socioeconomic status, degree of marginalization, region, type of location (urban rural), social security affiliation, employment -yes or no), reason for health service use (acute disease, chronic disease or prevention), length of illness, perceived severity of illness, health care provider (physician, nurse or other health care professional), improvement of health status after consultation, self-reported health status at the time of the survey (good, regular, bad), reported experience of access and health service use (travel and waiting time, length of consultation; charges for consultation, medicines, laboratory tests) and type of institution (MOH, SSI or PrivI).

Additionally, we conducted the same multivariable analysis for each of the institution types to identify possible interactions between the overall rating of quality of care and type of health care institution.

The National Health and Nutrition Survey received approval by the Ethics Committee of the National Institute of Public Health in 2005.

Results

In total, 11,959 HSUs were included in the analysis of whom 37.6% (n = 4,500) HSUs received care at MOH, 31.2%; (n = 3,730) used SSI and 31.2% (n = 3,729) PrivI. About 32% of those HSUs with SSI affiliation decided to use PrivI instead of SSI where they would receive free services at the point of care.

Comparing the reference points for travel and waiting times that HSUs defined as acceptable shows that there were no differences between institutions (Figure 1). An estimated average travel and waiting time of 10 minutes respectively was rated as acceptable by HSUs from all three institution types. When comparing acceptable waiting time with those reported shows that the largest difference exists for HSUs of SSI with 30 minutes followed by HSUs of MOH with 20 minutes and those of PrivI with only a 5 minute difference. Figure 2 shows that acceptable amount of expenditures on consultation, medicines and laboratory tests vary between institutions (note that only health services users who had to pay for services were included in this analysis). The difference between reported and acceptable median expenditure on medicines differed by 3.6 times ($160 versus $45) for HSUs of MOH and 2.3 times ($250 versus $110) for HSUs of PrivI.

The experiences of HSUs to access and use of services are reported in Table 1. The median travel time differs 5 minutes between institution types. HSUs using PrivI had to pay more frequently for medicines, consultation and laboratory tests compared to HSUs of MOH; HSUs of SSI paid least frequently. With respect to process related aspects, HSUs of SSI reported the shortest estimated consultation time (15 minutes) compared to MOH and PrivI (20 minutes respectively). Fewer HSUs of SSI reported that their health status after consultation had improved in comparison to HSUs of MOH and PrivI (70.4% versus 75.4% and 87.1% respectively).

The overall perception of low quality of care was highest for HSUs of SSI (28.3%) followed by HSUs of MOH (18.1%) and lowest for HSUs of PrivI (8.7%) (Table 1). The independent variables that best fit the final models were: age, self-reported health status, reason for health service use, improvement of health status after the consultation, waiting time, consultation length, payment of consultation, prescription filling and institution of care (Table 2). The most relevant aspects determining the per-

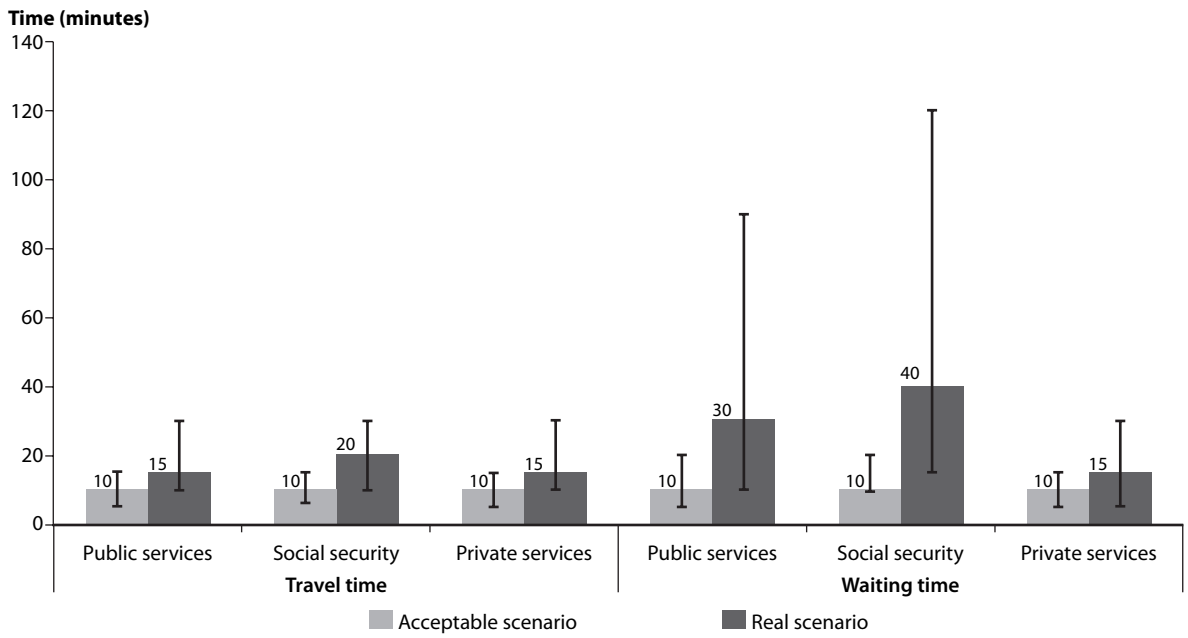

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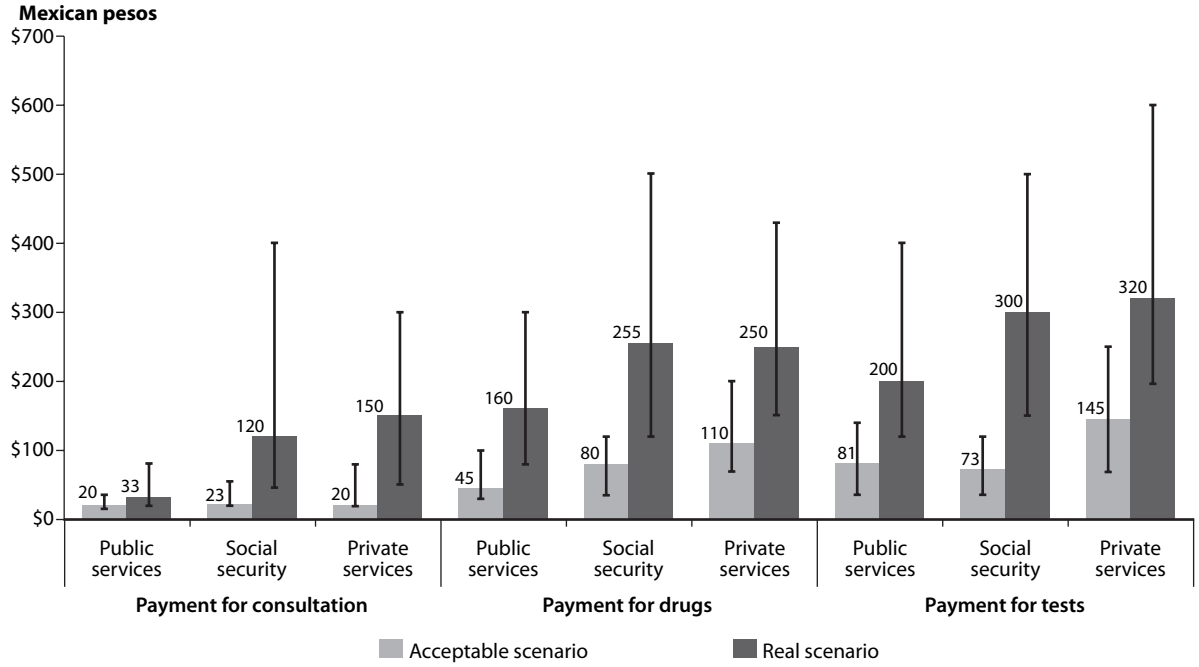
Figure 1. Comparison of acceptable and reported travel and waiting time (in minutes).
Note: Bars mark the interquartile range.



Note: Bars mark the interquartile range. Only health services users who had to pay for services were included in this analysis
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Figure 2. Acceptable and reported payment of consultation, medicines and laboratory tests (in Mexican pesos).

ception of a low quality of care was the institution type: the HSUs of MOH and SSI rated the quality of care lower than HSUs of PrivI (OR 4.36 for SS and 2.38 for MOH in comparison to HSUs of PrivI). A waiting time of longer than 60 minutes and consultation length of less than 20 minutes were associated with a low quality of care (OR for a waiting time between 15 and 60 minutes was 1.81 and for more than 60 minutes it was 3.20). No improvement of health status after consultation was also associated with low quality rating (OR of 2.93 for all users). Other key factors which determined the perception of an overall low quality of care were: bad health status at the time of the survey, acute and chronic diseases as the reason of seeking care in comparison to prevention, HSUs younger than 60 years, payment for consultation and not receiving medicines. Sex, education and socio-economic level were not found to be associated with low quality ratings in the model which included the institution as variable.

According to the institution type providing care, common factors associated with low quality of care were consultation length of less than 20 minutes, no improvement in health status and reporting bad health status at the time of the survey (Table 3). Important differences of factors associated with quality of care between the types of institutions are: prescription filling was associated only with low quality rating in the case of HSUs of MOH. Education level was only associated in the case of HSUs of PrivI (the HSUs with less education more frequently perceive quality of care as low) whereas socio-economic level (HSUs with medium to high level perceived quality of care lower than those HSU with lower socio-economic level) and reasons for health services use (HSUs with acute events were more likely to perceive quality as low versus those receiving preventative services) which were only associated with HSUs of SSI.

Discussion

The results of the study contribute to existing knowledge about health care quality in several ways. In Latin America, including Mexico, there is a paucity of analysis of the HSUs' experience of health care in combination with their respective ratings as well as the definition of reference points of acceptable care using HSUs' own experiences. The results of this work indicate that defining reference points according to the HSUs' own perception of care is useful for

Table 1. Health service users' (HSU) experiences in access and use according to the institution of care and overall perception of quality of care

Variable	All institutions n = 11,959	HSU of public institutions (MOH) n = 4,500	HSU of social Security institutions (SSI) n = 3,730	HSU of private institutions (PrivI) n = 3729	p value*
Access					
Travel time	20 (10-30)	15 (10-30)	20 (10-30)	15 (10-30)	<0.001
Waiting time	30 (10 - 60)	30 (10-90)	40 (15 - 120)	15 (5 - 30)	<0.001
Expenditure on medicines**+	$200 ($120 - $400)	$150 ($75 - $300)	$250 ($100 - $500)	$250 ($150 - $416)	<0.001
Expenditure on laboratory+ tests	$300 ($150 - $500)	$205 ($120-$400)	$300 ($150-$500)	$320 ($198-$600)	<0.001
Expenditure on consultation+	$100 ($25 - $250)	$32.5 ($20 - $80)	$120 ($45-$400)	$150 ($50-$300)	<0.001
Structure					
% of HSU with prescription filled	66.3	64.2	90.3	45.6	<0.001
% HSU paying for their medicines	45.8	36.8	6.6	89.0	<0.001
% HSU which had their laboratory tests	75.6	71.8	77.1	77.6	<0.001
% HSU which paid for their laboratory tests	32.22	40.54	5.51	63.46	0.006
% HSU which paid for their consultation	36.7	27.0	2.4	87.1	<0.001
Process					
Duration of consultation	20 (15 - 30)	20 (10 - 30)	15 (10 - 25)	20 (15 - 30)	<0.001
% HSU who received a prescription	86.5	82.3	86.1	92.7	<0.001
% HSU who received a prescription for laboratory tests	24.7	19.7	34.2	22.4	<0.001
Results					
% HSU who reported improved health status after their consultation	77.6	75.4	70.4	87.1	<0.001
% HSU who perceived the overall quality of care low	18.34	18.1	28.3	8.7	<0.001

Values are medians or percentages, percentile 25-75 in parentheses; *p value of Kruskal Wallis differences between the three types of services; **Expenditure reported in Mexican pesos of 2006; +out of those HSU who paid

Table 2. Association between the overall perception of low quality of care and health service users' (HSU) characteristics

Variable		n (7,440)	Unadjusted OR (95% IC)	Adjusted OR (95% IC)
Sex	Female	4,734 (63.6%)	1.15 (0.93 - 1.43)	1.02 (0.82 - 1.28)
Age (years)	0-5	201 (2.7%)	0.84 (0.49 - 1.45)	1.07 (0.58 - 1.96)
	6-17	1,544 (20.8%)	1.05 (0.79 - 1.39)	1.61 (1.15 - 2.26)**
	18 -35	1,379 (18.5%)	1.24 (0.93 - 1.66)	1.72 (1.21 - 2.47)**
	36-47	1,309 (17.6%)	1.12 (0.84 - 1.50)	1.44 (1.05-1.98)*
	48-59	1,250 (16.8%)	1.20 (0.90 - 1.60)	1.35 (0.96 - 1.89)
	> = 60	1,757 (23.6%)	1	1
Schooling	None	1,196 (16.1%)	0.91 (0.69 - 1.20)	1.31 (0.89 - 1.93)
	Elementary	3,612 (48.6%)	0.94 (0.75 - 1.18)	1.08 (0.82 - 1.42)
	Secondary or higher	2,632 (35.4%)	1	1
Socioeconomic Status	0	2,884 (38.8%)	1.32 (0.95 - 1.83)	1.38 (0.93 - 2.03)
	1	1,561 (20.9%)	1.04 (0.73 - 1.47)	1.07 (0.70 - 1.62)
	2	2,188 (29.4%)	1.32 (0.95 - 1.83)	1.36 (0.94 -1.99)
	3	807 (10.9%)	1	1
Health status at the time of the Survey	Bad	971 (13.1%)	1.97 (1.47 - 2.66)**	1.84 (1.32 - 2.56)**
	Regular	3,226 (43.4%)	1.64 (1.34 - 2.00)**	1.63 (1.31 - 2.03)**
	Good	3,243 (43.6%)	1	1
Reason for health service use	Acute care	4,420 (59.4%)	1.09 (0.75 - 1.58)	1.66 (1.11 - 2.48)*
	Chronic care	2,359 (31.7%)	1.13 (0.76 - 1.69)	1.28 (0.84 - 1.93)
	Preventative services	661 (8.9%)	1	1
No improvement in health status after consultation		1,518 (20.4%)	3.24 (2.62 - 4.00)**	2.93 (2.29 - 3.76)**
Waiting times (minutes)	<15	2,157 (29.0%)	1	1
	15 -60	3,242 (43.6%)	2.28 (1.69 - 3.08)**	1.81 (1.35 - 2.45)**
	>60	2,041 (27.4%)	4.94 (3.61 - 6.76)**	3.20 (2.35 - 4.35)**
Consultation length	<15	3,320 (44.6%)	1	1
	15-20	1,793 (24.1%)	2.36 (1.87 - 2.97)**	2.03 (1.60 - 2.57)**
	>20	2,327 (31.3%)	1.35 (1.02 - 1.79)*	1.19 (0.89 - 1.59)**
Payment for consultation (Yes)		2,791 (37.5%)	0.50 (0.40 - 0.62)**	1.42 (1.03 - 1.96)*
Prescription filling (No)		5,093(68.5%)	0.85 (0.67 - 1.06)	1.32 (1,03 - 1.70)*
Institution	Private	2,189 (29.4%)	1	1
	Public	2,654 (35.7%)	2.93 (2.15 - 4.00)**	2.38 (1.63 - 3.47)**
	Social Security	2,597 (34.9%)	4.18 (3.17 - 5.52)**	4.36 (2.95 - 6.44)**

*significant at 5%; ** significant at 1%

setting targets for quality improvements. The results also show that prioritizing reduced waiting times, improved health status after consultation and increased consultation time would increase overall quality of care ratings.

Before discussing these results in more detail it is relevant to mention the study limitations. ENSANUT does not include aspects related to physician-patient communication, shared decision-making, selection of provider, the attitude of the health professionals and the time it takes to obtain an appointment with a physician. These aspects have been identified as relevant when analyzing perception of health care quality[25] and should be included in future National Health Survey instruments. Another limitation is that the survey does not permit measuring quality over time for the same HSUs; literature has shown that ratings change over time.[26] The sample size of HSUs in ENSA-

Table 3. Multivariable binominal logistic regression model of factors associated with low quality of care ratings by health service users

Variable		Public Services OR (95% IC)	Social Security OR (95% IC)	Private Services OR (95% IC)
Sex	Female	0.93 (0.66 - 1.31)	1.13 (0.83 - 1.53)	1.07 (0.65 - 1.76)
Age	0-5	1.48 (0.61 - 3.58)	1.07 (0.28 - 4.16)	0.41 (0.09 - 1.78)
	6-17	1.69 (0.93 - 3.04)	1.48 (0.94 - 2.32)	1.49 (0.64 - 3.46)
	18 -35	1.70 (0.93 - 3.11)	1.23 (0.77 - 1.99)	3.09 (1.21 - 7.84)
	36-47	1.61 (0.91 - 2.84)	1.34 (0.86 - 2.08)	1.13 (0.51 - 2.47)
	48-59	1.22 (0.62 - 2.42)	1.18 (0.79 - 1.77)	1.63 (0.81 - 3.28)
Schooling	None	1.36 (0.70 - 2.64)	0.74 (0.44 - 1.25)	4.21 (1.90 - 9.30)**
	Elementary	1.05 (0.63 - 1.75)	0.79 (0.55 - 1.13)	2.88 (1.45 - 5.73)**
	Secondary or higher	1.0		
Socioeconomic status	0	2.34 (0.71 - 7.65)	1.48 (0.89 - 2.45)	0.72 (0.28 - 1.83)
	1	1.36 (0.41 - 4.51)	1.22 (0.74 - 2.01)	0.91 (0.35 - 2.35)
	2	2.58 (0.79 - 8.35)	1.56 (1.01 - 2.42)*	0.58 (0.22 - 1.50)
	3	1.0		
Health status at the time of the survey	Bad	1.85 (1.04 - 3.29)*	1.59 (1.03 - 2.46)*	2.66 (1.17 - 6.06)*
	Regular	1.75 (1.20 - 2.56)**	1.42 (1.02 - 1.99)*	1.76 (1.01 - 3.07)*
	Good	1.0		
Reason for health service use	Acute care	1.36 (0.66 - 2.79)	1.74 (1.05 - 2.89)*	1.38 (0.48 - 3.98)
	Chronic care	1.17 (0.53 - 2.56)	1.39 (0.84 - 2.30)	0.83 (0.28 - 2.51)
	Preventative services	1.0		
No improvement in health status after consultation		2.14 (1.47 - 3.12)**	2.93 (2.17 - 3.95)**	5.64 (3.19 - 9.97)*
Waiting times (minutes)	<15	1.0		
	15-60	1.96 (1.20 - 3.21)**	2.11 (1.33 - 3.34)**	1.24 (0.70 - 2.18)
	>60	3.29 (2.04 - 5.30)**	4.10 (2.53 - 6.63)**	1.41 (0.58 - 3.41)
Consultation length	<15	1.0		
	15-20	1.98 (1.34 - 2.93)	1.71 (1.21 - 2.41)*	2.65 (1.50 - 4.71)**
	>20	1.40 (0.89 - 2.20)**	1.14 (0.74 - 1.76)**	0.77 (0.42 - 1.41)**
Payment for consultation (Yes)		1.31 (0.91 - 1.88)	1.25 (0.57 - 2.71)	1.43 (0.73 - 2.79)
Prescription filling (No)		2.04 (1.45 - 2.88)*	1.26 (0.80 - 1.98)	0.66 (0.40 - 1.08)

*significant at 5%; ** significant at 1%

NUT 2006 is not large enough to make meaningful comparisons between different Mexican states (Mexico has 32 states) although this would be very relevant as states are largely autonomous with respect to health service delivery. Finally, due to the fact that we analyzed reported experience of HSUs the reported travel, waiting and consultation time were estimated and frequently rounded (instead of 12 minutes the HSU rounded it downwards to 10 minutes and instead of 14 minutes 15 minutes were reported) which resulted in some inaccuracies.

Defining reference points using the quality ratings of HSUs could be very useful for quality improvement programs such as SICalidad in Mexico or in other countries as it quantifies how much travel and waiting times or expenditure need to be reduced to improve the general HSUs' perception of quality of care. Strength of the study is that it asked HSU about actual and not hypothetical cases of health service use. For instance, our results highlight that on average a travel and waiting time of 10 minutes respectively is acceptable to ambulatory HSUs

of all institutions. However, the gap between the reference points and reported waiting time is largest for HSUs of SSI at 30 minutes and second for MOH at 20 minutes. Although the Ministry of Health quality program periodically reports waiting times it does not provide a measure regarding what waiting time HSUs on average have rated as acceptable.[16] In general, expenditure on medicines, laboratory tests and consultations were much higher than what were defined as acceptable expenditure by HSUs. Particularly, the expenditure on medicines, laboratory and consultation is very likely a barrier to access for HSUs of MOH since the large majority belongs to the lowest socio-economic group.

The reference points of acceptable care were defined for those aspects of care for which the survey instrument provided both types of information: HSU experience and their respective ratings. However, it would be very important in future surveys to include additional questions which allow combining reported experience with HSUs' ratings for other aspects related to quality of care (for example consultation length in the present instrument is only analyzed by asking HSU about the estimated duration; their respective ratings are omitted).

Second, the results show that the experiences of HSUs in access and use differed significantly between institution types which mean that quality improvement programs should take into account these differences and be tailored towards those aspects where quality is rated particularly low in each institution. For instance, although state-run institutions have committed themselves to provide medicines and laboratory test free of charge or for a small fee,[22] fewer HSUs of MOH received a prescription of medicines and laboratory tests compared to HSUs of SSI. Improving provision of medicines and laboratory tests is clearly an area of improvement for MOH. The long waiting times most frequently reported by HSUs of SSI in comparison to the other two institutions studied means that quality improvement program should develop strategies to reduce waiting time particularly in SSI.

Finally, our results help to prioritize which aspects of care need to be improved by showing which factors have the largest impact on HSU perception of low quality of care. In our study, institution was one of the key factors. This is in line with other authors who also found that the type of institution is the most important factor in terming overall perception of quality of care in Mexico.[17,18] It also is consistent with other studies which reported that prepaid services were rated lower in quality than fee-for-service visits.[24] Waiting times and no improvement in health status after consultation were other factors. That HSUs of SSI most often reported no improvement in health status after consultation seems contrary to the finding that more SSI HSUs receive medicines, laboratory tests and consultation free at the point of care than their counterpart at MOH and PrivI. The question of which factors contributed to less beneficial health outcomes for HSUs of SSI -even though material supplies such as medicines and laboratory facilities were available- is certainly very relevant and needs further investigation. Particularly, one must consider that 32% of those HSUs with social security decided to use PrivI, which results in large inefficiencies where households which are already paying social security insurance incur out-of-pocket expenditure for private consultations. We explored if the perception of improved health status after health service use could have a mediating effect on other variable, but no significant associations with other variables were found. We also examined whether the institution type was a confounding factor or a mediating factor. In theory, institution could be a confounding factor since it is related with the socioeconomic status and education level, both of which are associated with the perception of quality of care. However, the association of the variables remained the same when conducting models for each institution type.

Our results show that the length of the consultation was another important factor influencing overall rating of quality of care, where duration of less than 20 minutes was associated with lower quality of care rating. The saturation of SSI services could be one explanation for the shorter duration compared to MOH and PrivI.[27] Consultation lengths vary by countries and by type of services: in Germany, average consultation time was 7.4 minutes, in Belgium 15 minutes and in India 5 minutes.[27,28] The observed differences between MOH and SSI on one side and PrivI on the other are probably related to the different organization of care where private physicians need to invest time to ensure that the patient returns.[27] Since our results show that consultation length was relevant in the overall rating of quality it should be included in the indicators of quality improvement programs such as SICalidad.

Other authors have generally found that older people, women, those of lower socio-economic status and better health status are associated with high ratings of quality of care.[29] This is in line with our results which show that HSUs with better health status and older than 35 years rated quality higher in comparison to other groups of HSUs. However, in the case of HSUs of SSI we found

that - contrary to the other previous findings- medium/high socio-economic status was associated with lower ratings of quality of care in comparison to those HSUs of high socio-economic level. Sex was not associated with quality rating.

Conclusions

As strategies to improve health care quality have been important elements of health care reforms in Latin America in the last decades[30] evaluation of the impact of the reforms and justifying increasing expenditure in health measuring quality of care have become increasingly relevant. Quality of care can be measured in various ways and it has been argued that HSU perception is an essential component, since HSUs have the right to a certain standard of quality of care and because the perception of high quality improves their health outcomes.[31] This study shows that the combination of factual information of the HSU experience with their perception is important to identify how services needs to change in order improve HSU perception of its quality. The results of this study also help to prioritize which aspects of health care quality are more relevant to HSU. The 2006 National Health Survey instruments in Mexico allowed only defining reference points for travel and waiting time as well as expenditure on medicines, laboratory and consultation. Establishing reference points for other aspects related to quality of care will be relevant for monitoring quality in health services.

Authors' contributions

ALS analyzed the data with support of SKE, VJW and YSAT. ALS wrote the first draft of the methods and result section of the manuscript which was substantially revised by VJW and SKE. The introduction, discussion and final version of the manuscript was prepared by VJW and revised by all authors.

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Strengthening preventive care programs: a permanent challenge for healthcare systems; lessons from PREVENIMSS México*

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It has been a long-standing fact that curative care receives most of the healthcare budgets;[1] however, preventive care is receiving further attention from scholars, politicians and decision makers given its effectiveness on people's health and its long-term effect on social expectancies and well-being[2] Current emphasis has shifted toward cost-effective delivery of healthcare[3] which implies finding equilibrium between curative and preventive care through reinforcing primary care services.[4] The World Health Organization is a strong advocate to renew primary health care (PHC) pointing out that it is the cornerstone of health systems and is the best way to provide comprehensive, equitable and affordable health care. Preventive care is within the main components of PHC and when the provision is comprehensive, it increases the access and uptake of preventive services, which in turn contributes to obtain better health and improved quality[5] Providing preventive services within PHC facilitate to obtain both, technical and productive efficiency. A number of technical documents have stressed the importance of prioritizing health interventions to better allocate the scarce resources.[6-10]

The Instituto Mexicano del Seguro Social (IMSS) is the largest public healthcare system in Mexico. It is a nationwide institution that administratively is divided in state delegations. IMSS provides social, economic and health protection to workers of the formal sector and their families. The workers of the formal sector are those employed with regular wages and hours, with employment rights and tax payments. Its members work in the industry and in the services sector such as commerce, transportation, etc.[11] IMSS provides services in urban areas and almost all of its members have basic sanitary conditions (water, electricity, sewerage, etc.).

Healthcare benefits comprise preventive, curative and rehabilitation care that is provided in primary care clinics, secondary and tertiary care hospitals. IMSS revenues come from three parties: the government, the employers and the employees. The latter pay the premium according to their income.

Currently, IMSS provides care to approximately 48 million members. Since the year 2000, this institution reoriented its vision regarding the provision of medical care and began to search for an appropriate balance in its healthcare expenditures for both curative and preventive care. In 2007, chronic conditions such as type 2 diabetes, hypertension, chronic renal failure, cervical cancer, breast cancer and HIV/AIDS accounted for 12.15% of the total IMSS healthcare

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expenditures. The projections for the year 2050, using an optimistic scenario that includes the strengthening of preventive measures and technological innovation, estimated that the percentage of IMSS healthcare expenditures for these seven conditions would be 22% and the pessimistic scenario (not investing in preventive and curative care) estimated an increase of 57% in health expenditures.[11]

To strengthen preventive care, IMSS carried out a situation analysis of the way in which these services were provided. The analysis showed: 1) lack of coordination to provide preventive care. There were > 30 isolated preventive programs (i.e., vaccination program, family planning program, cervical cancer screening program, and so on). These programs were competing among themselves for resources and personnel; 2) gaps in the health information system that was unable to provide exact figures regarding its coverage. To tackle these flaws, the institution developed the program PREVENIMSS (the Spanish acronym for IMSS' Integrated Preventive Care Program) that aimed at improving the delivery of service, and at evaluating the progress of coverage of preventive care services. The usual definition of coverage is the regular update of the proportion of individuals who need an intervention and actually receive it; therefore, information about coverage is key to evaluate health programs.

Three strategies integrated the organizational changes supporting the implementation of this program: (1) Integration of the scattered preventive activities into a comprehensive package. (2) Reorientation of evaluation criteria, shifting from evaluation of productivity to evaluation of coverage. IMSS launched PREVENIMSS in 2001 and this was accompanied by a permanent mass media campaign with radio and television advertisements. A careful description of PREVENIMSS has been published elsewhere.[12]

1. Integration of preventive services. PREVENIMSS reorganized the provision of preventive services by programmatic age groups: children (0-9 years), adolescents (10-19 years), women (20-59 years), men (20-59 years) and older adults (60 years and older). A number of organizational and procedural changes took place at central, district and local level. The old appointment booklets for IMSS individual members were redesigned to include preventive information, dated registries of preventive services, and reminders tailored to suit each programmatic age group. The booklet is the official document where preventive services are being registered each time that an IMSS member receives preventive care at IMSS facilities. Thus, the booklet contains registries about vaccines, screening and educational activities. It also registers the appointments to provide programmed preventive services. Each IMSS member has his/her individual booklet.

Preventive services for each age group were reviewed and updated continuously. Table 1 shows the preventive services for each age group. The broad areas of preventive services were: health promotion, nutrition, prevention, control and screening of selected diseases.

2. Reorientation of evaluation criteria. The former criterion to evaluate the progress of preventive actions was productivity; the criteria were reoriented to evaluate coverage. The registries of productivity served only to ascertain the number of preventive actions provided; no denominator was used for this measure. Instead, for coverage, criteria to receive a preventive action were defined to meet the health needs of the affiliated population; i.e., immunization schemes according to age and dose, or periodicity of cervical cancer screening based upon risk factors. This decision helped to focus the provision of preventive actions based in actual health needs rather than in the percentage of people receiving preventive services.

With the aim of showing the complexity of implementing large scale preventive care programs to reinforce PHC, the objective of this paper is to describe the increase of coverage of preventive actions through the PREVENIMSS program and the magnitude of the unmet needs of some of the most important unsolved and emergent health problems, such as anemia in children, and the growing increase in the prevalence of overweight and obesity and of its consequences, type 2 diabetes and hypertension.

Methods

The evaluation of PREVENIMSS' coverage was conducted through four population surveys that were carried out in the years 2003, 2004, 2005 and 2006. These surveys were called ENCOPREVENIMSS for its Spanish acronym: PREVENIMSS National Coverage Surveys. All four nation-wide cross sectional surveys were designed as probabilistic, population-based. The study population was all IMSS members across the country. IMSS considers as a member a person who is entitled to receive social security services within which healthcare is included; this comprises the insured and their beneficiaries (spouse, children, and parents).

The information of preventive care was obtained through home interviews and included all IMSS members living in the house, whether or not they had used

Table 1. PREVENIMSS main activities by age group

Activities	Children 0-10 years	Adolescents 11 -19 years	Women 20-59 years	Men 20-59 years	Older adults > = 60 years
Health promotion	**Delivery of PREVENIMSS booklets**				
	Measurement of height, weight and waist				
Nutrition	Iron supplementation Vitamin A supplementation Intestinal parasites treatment	Intestinal parasites treatment Folic acid supplementation (pregnant teenagers)	Detection of anemia; iron supplementation; folic acid supplementation (pregnant women)		
Prevention and control of diseases	Vaccines: BCG, Sabin; DPT+HB+Hlb; Influenza; measles, rubella, pertussis, Oral rehydration therapy for acute diarrhea, identification of alarm signs in acute respiratory infections	Vaccines: measles-rubella, tetanus toxoid, two-dose hepatitis B, Provision of condoms to prevent STDs and HIV/AIDS and unwanted pregnancies	Vaccines: measles-rubella, tetanus toxoid, diphtheria Tuberculosis: screening and directly observed treatment	Vaccines: measles-rubella, tetanus toxoid. Tuberculosis: screening and directly observed treatment	Vaccines: pneumonia, influenza, tetanus toxoid and diphtheria; Tuberculosis: screening and directly observed treatment
Screening	Congenital hypothyroidism, Phenylketonuria. Congenital adrenal hyperplasia, Biotinidase deficiency, Visual acuity, Childhood caries	Visual acuity	Cervical cancer Breast cancer Type 2 diabetes Hypertension	Type 2 diabetes Hypertension	Cervical cancer Breast cancer Type 2 diabetes Hypertension
Reproductive health		Family planning and antenatal care		Family planning	

IMSS services or looked for care in other healthcare institutions, either public or private. The answers provided by the interviewee were confirmed by reviewing the information registered at the PREVENIMSS booklet.

The surveys had ethical approval from the IMSS Institutional Review Board. All participants received information about the purpose of the study and were asked for their informed consent before starting the interview. To collect information from children, the mother or caretaker should have to provide her informed consent.

Sampling design

The sampling design took into account that IMSS is divided into 37 state delegations. The surveys were planned to be representative in every state delegation for each programmatic age group. A four-stage sampling design was used. In the first stage, six family medicine clinics all belonging to the IMSS health care system were randomly chosen at each state delegation; this represented a total of 222 family medicine clinics. At the second stage, the geographic area of influence of each family medicine clinic was considered; then, a portion of this area was randomly chosen. At the third stage, a specific neighborhood was randomly selected. The fourth stage consisted in identifying the households where IMSS members were living; the interviewers did home visits looking for IMSS members. The interviewers were up to three times to the house to contact the potential participant. If the interviewers were unable to contact the residents of the selected household or if they refused to participate, then, the household was replaced with another with similar characteristics.

The primary sampling unit was the household and the elementary unit was the IMSS member. We interviewed all household members entitled to receive IMSS services. This is because IMSS policy consists in providing health care to the worker and his/her family dependants.

To get the estimates of coverage per programmatic age group, the sample size for the surveys was calculated using the following formula:

$$n=pq\left[\frac{(Z\propto/2)^2}{\delta^2}\right]\frac{DEFT}{1-NR}$$

Assumptions: n = sample size, p = proportion of coverage (0.6), q = 1-p, α = 0.05, δ = 0.05, design effect (DEFT) = 1.2, and non-response rate (NR) = 10%.

In the first survey (2003) the proportion of coverage (p) was estimated to be 0.8. Thus the n for this survey was lower than for the surveys of the years 2004, 2005 and 2006.

The resulting sample size was 492 participants in each programmatic age group per state delegation. The total sample size per delegation was 2,460, which multiplied by the 37 state delegations resulted in ~91,000 individuals in each survey.

Sources of information and main variables

The PREVENIMSS booklet was the main source of information and as mentioned earlier, physical measures were taken in a subsample of interviewees for the 2006 survey.

The main variables in each programmatic age group were:

- Children (0-9 years): registry of height and weight, iron supplementation, oral health activities, visual acuity measurement and vaccines scheme.
- Adolescents: (10-19 years): registry of height and weight, oral health activities, visual acuity measurement, vaccines scheme and use of condoms.
- Women (20-59 years): registry of height, weight and waist, screening for tuberculosis, cervical cancer, breast cancer, type 2 diabetes and hypertension.
- Men (20-59 years): registry of height, weight and waist, screening for tuberculosis, type 2 diabetes and hypertension.
- Older adults (60 years and older): registry of height, weight and waist, pneumococcal vaccine, influenza vaccine, screening of tuberculosis, cervical cancer (women), breast cancer (women), type 2 diabetes and hypertension.

Sociodemographic variables: age, sex, place of residence, literacy of individuals 5 years and older, occupation and size of the family (defined as the number of people living in the house).

In the 2006 survey, to complement the information, we took physical measures to estimate the prevalence of several conditions (unmet health needs). To obtain the information to estimate the prevalence of malnutrition, overweight and obesity, the interviewers measured height, weight, waist and hip circumferences to 25% of all interviewees. The interviewers were nurses that were previously trained and standardized to measure weight and height. All were independent from IMSS and hired for this survey.

The levels of cholesterol and blood glucose were measured in 25% of interviewees that were above 19 years old. The Accutrend® GCT, Roche was used for this purpose.

The levels of hemoglobin to ascertain anemia were measured in 25% of children below 5 years. We used the B-hemoglobin photometer (HemoCue®, Ångelholm, Sweden) for this purpose.

Blood pressure measurements to 25% of interviewees older than 19 years were taken by using sphygmomanometers (TJX MD 3000).

Criteria to ascertain overweight and obesity were as follows:

- Children less than five years old: overweight, body mass index (BMI) between 2-3 Z score; obesity, > 3 Z score of WHO growth standard[13]
- Children 5 to 9 years: overweight and obesity BMI criteria of International Obesity Task Force[14]
- Adolescents: Overweight and obesity, BMI criteria of International Obesity Task Force[14]
- Women, men and older adults: overweight, BMI 25 to 29.9; obesity, BMI > = 30[15]

Criteria for type 2 diabetes screening: fasting glucose ≥ 126 mg/dl; casual glucose ≥ 200 mg/dl.

Criteria for hypertension: systolic blood pressure ≥ 140 mm Hg in two subsequent measurements or diastolic blood pressure ≥ 90 mm Hg in two subsequent measurements in the same visit, at the beginning and at the end of the visit.

Data analysis

The statistical analysis included the ascertainment of the proportion of IMSS members who received preventive services. This was evaluated according to each programmatic age group. The increase of coverage throughout the years was estimated by comparing the groups of subjects

per age group, year and type of preventive care. The slopes were compared by running a simple regression analysis, and the assessment of the goodness of fit was done by calculating the correlation coefficients (r^2).[16]

Results

Population Characteristics

The number of IMSS members interviewed ranged from 79,797 respondents in 2003 to 117,036 respondents in 2006. Table 2 shows the age distribution of the people interviewed. The age distribution corresponds fairly with the sample design and it should not be considered representative of the age distribution of IMSS members. The individual non-response rate in the four surveys was below 10%.

Coverage

Health programs for children

Coverage of preventive programs for children increased continuously: iron supplementation in children < 1 year (17.8% to 65.5%) prevention of childhood caries (40.5% to 58.1%) screening for congenital metabolic disorders phenylketonuria, congenital adrenal hyperplasia, biotinidase deficiency (60.3% to 81.6%) and visual acuity testing (12.5% to 47.5%) (table 3).

Health programs for adolescents

Almost all components of the adolescents program, excepting the vaccination program, were implemented right from the onset of PREVENIMSS. The activities included measurement of weight and height, vaccines: measles - rubella (52.4% to 71.4%), tetanus toxoid- diphtheria (68% to 80%) hepatitis (9.3% to 46.2%) There was also increase in the use of condoms (17.9% to 59.9%) and in visual acuity testing (2.1% to 61.2%), (Table 3).

Health programs for women

Measles-rubella vaccine increased from 28.5% to 59.2%, women undergoing cervical cancer screening for the first time or subsequent screening (three-year interval) increased from 66.7% to 75%. Breast cancer screening by using mastography began in 2004 and by the year 2006 its coverage was 22.1% (Table 4).

Health programs for men

Weight and height measurements increased (56.8% to 73.9% and 47.2% to 70.6% respectively), type 2 diabetes screening increased from 38.6% to 57.8% and hypertension screening increased from 48-4% to 64.0% (table 4).

Health programs for older adults

Pneumococcal vaccination coverage increased from 13.2% to 24.9%. Influenza vaccine coverage also increased from 12.6% to 52.9 (table 4).

The linear slopes and the r^2 linear adjustment outcomes show the strength of the linear relationship between PREVENIMSS and the increase in coverage for the different components of the program. This represents that the largest values in the table (closer to 1 or 100%) show the straight-line relationship between the program and the attained coverage figures.

Table 2. Households and population respondents. ENCOPREVENIMSS 2003-2006

Households with IMSS members	2003 34,610		2004 37,877		2005 44,278		2006 40,682	
Population respondents	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Children (< 10 years)	15,289	19.2	20,762	17.6	23,177	18.9	22,365	19.1
Teenagers (10 to 19 years)	13,356	16.7	20,259	17.2	21,474	17.6	20,701	17.7
Women (20 to 59 years)	22,165	27.8	30,910	26.2	32,317	26.4	29,939	25.6
Men (20 to 59 years)	16,275	20.4	25,745	21.8	25,375	20.7	24,507	20.9
Older adults (> 59 years)	12,712	15.9	20,208	17.1	20,037	16.4	19,524	16.7
Total	79,797	100.0	117,884	100.0	122,380	100.0	117,036	100%

Table 3. Coverage of preventive services provided to children and adolescents

Coverage indicators in each age group	Year				Linear slope	r^2 linear adjustment
	2003	2004	2005	2006		
Children	**n = 15,289 %**	**n = 20,762 %**	**n = 23,177 %**	**n = 22,365 %**	**%**	**%**
Delivery of PREVENIMSS booklets	32.1	62.7	77.2	90.7	19.0	95.5
Weight measurement	72.2	73.5	79.0	84.4		
Height measurement	56.6	70.3	76.0	81.7		
Iron supplementation in children < 1 year old	17.8	46.0	47.7	65.5		
Completed scheme of vaccination by age	91.4	91.0	91.4	90.3	-0.3	52.1
Fluoride application	40.5	42.0	43.2	58.1	5.4	72.7
Hypothyroidism screening	97.1	96.7	98.5	98.0	0.4	49.9
Screening for congenital adrenal hyperplasia, phenylketonuria and biotinidase deficiency	--	-	60.3	81.6	21.3	100.0
Visual acuity screening	12.5	22.5	32.1	47.5	11.5	98.6
Adolescents	**n = 13,356 %**	**n = 20,259 %**	**n = 21,474 %**	**n = 20,701 %**	**Linear slope %**	**r^2 linear adjustment**
Delivery of PREVENIMSS booklets	25.9	54.6	68.9	84.3	19.0	97.0
Weight measurement	36.3	57.7	64.1	73.2	11.7	92.8
Height measurement	33.8	55.3	61.6	71.1	11.8	93.0
Measles-rubella vaccine	52.4	55.6	58.8	71.4	6.0	87.2
Tetanus toxoid and diphtheria vaccine	68.0	65.8	63.7	80.0	3.4	36.0
Hepatitis B vaccine	9.3	17.7	26.1	46.2	11.9	94.5
Use of condom in last intercourse	17.9	30.4	42.2	59.9	13.8	99.1
visual acuity screening	2.1	30.1	51.5	61.2	19.9	95.9

Unmet needs

Prevalence of anemia in children one to four years old (ENCOPREVENIMSS 2006): Figure 1 shows that children under one year of age had the highest prevalence (30.8%) of anemia. The level of incidence decreases progressively with age, the lowest figure being observed in children four years old (12%). The overall proportion of anemia in children 0-4 years was 19%.

Overweight, obesity, type 2 diabetes and hypertension (Figures 2 and 3): Among the most important findings of ENCOPREVENIMSS are the prevalence of overweight and obesity, type 2 diabetes and hypertension, in both diagnosed and undiagnosed cases. The prevalence of overweight and obesity in every age group was as follows: children 9.5%; adolescents 30.9%; men 61.3%; women 62.1% and older adults 69.9%. The total prevalence of type 2 diabetes was 14.8%, and 10% of the people with diabetes were unaware about their condition. One out of every four adults aged between 20 and 59 years had diabetes and the frequency of this condition increased with age. Total prevalence of hypertension was 35.6% and four out of ten people with hypertension were unaware that they had this condition. Prevalence of hypercholesterolemia was 12.8% in men, 14.6% among women and 22.1% in older adults; 75.1% were unaware about having this condition.

Geographical distribution of overweight and obesity (Table 5): To analyze this information the country was divided arbitrarily in five regions: North (States of Baja California, Baja California Sur, Coahuila, Chihuahua, Durango, Nayarit, Nuevo Leon, Sinaloa, Sonora y Tamaulipas), Center (States of Aguascalientes, Colima, Guanajuato, Hidalgo, Jalisco, Estado de Mexico, Michoacán, Morelos, Puebla, Queretaro, San Luis Potosí, Tlaxcala, Veracruz y Zacatecas), South (States of Chiapas,

Table 4. Coverage of preventive services provided to women, men and older adults

Coverage indicators in each age group	Year				Linear slope	r^2 linear adjustment
	2003	2004	2005	2006		
Women	**n = 22,165 %**	**n = 30,910 %**	**n = 32,317 %**	**n = 29,939 %**	**%**	**%**
Delivery of PREVENIMSS booklets	34.9	66.5	80.5	90.0	17.9	92.5
Weight measurement	69.7	69.5	79.0	84.9	5.5	89.3
Height measurement	51.1	61.6	74.0	80.4	10.0	98.6
Waist measurement	8.1	17.2	26.4	52.9	14.4	91.9
Measles rubella vaccine	28.5	36.2	43.9	59.2	10.0	96.6
Breast cancer screening						
Clinical exam	42.6	45.3	50.4	62.4	6.5	90.2
Mastography		6.5	7.9	22.1	7.8	81.7
Cervical cancer screening						
Once in lifetime	81.3	78.8	82.4	86.9	2.0	60.5
Once in the last 3 years	66.7	72.4	74.5	75.0	2.7	84.0
Once in the last year	40.6	51.0	45.1	43.3	0.2	0.4
Diabetes mellitus screening	45.3	55.1	56.8	66.5	6.5	94.3
Hypertension screening	60.6	66.0	70.6	74.2	4.5	99.2
Men	**n = 16,275 %**	**n = 25,745 %**	**n = 25,375 %**	**n = 24,507 %**	**Linear slope**	**r^2 linear adjustment**
Delivery of PREVENIMSS booklets	25.1	55.3	70.9	85.1	19.6	96.3
Weight measurement	56.8	53.8	62	73.9	6.0	75.2
Height measurement	47.2	49.4	58.7	70.6	8.0	92.8
Waist measurement	3.8	9.7	16.6	45.1	13.1	85.2
Measles rubella vaccine	21.9	28.8	35.7	49.4	8.9	96.6
Diabetes mellitus screening	38.6	41.7	44.4	57.8	6.0	84.8
Hypertension screening	48.4	49.1	56.5	64.0	5.4	91.4
Older adults	**n = 12,712 %**	**n = 20,208 %**	**n = 20,037 %**	**n = 19,524 %**	**Linear slope**	**r^2 linear adjustment**
Delivery of PREVENIMSS booklets	49.3	75.5	84.4	92.7	13.9	91.1
Weight measurement	64.7	76.9	83.1	88.2	7.7	95.5
Height measurement	48.3	71.1	78	83.9	11.4	88.7
Waist measurement	4.5	13.7	23.5	52.9	15.5	90.9
Pneumococcal vaccine	13.2	24.4	23.6	24.9	3.4	63.1
Influenza vaccine	12.6	27	37.2	52.9	13.1	99.4
Tuberculosis vaccine	1.9	2.8	3.7	5.0	1.0	99.1
Diabetes mellitus screening	34.8	54.4	56	65.2	9.3	87.8
Hypertension screening	46.0	66.9	71.8	75.0	9.2	82.7

Guerrero y Oaxaca), Southeast (States of Campeche, Quintana Roo, Tabasco and Yucatán) and Mexico City. The wealthiest states of the country are in the North region, whereas the states of the Central and Southeast regions and Mexico City, are a mix of low, middle and upper income; while the three states of the South Region are predominantly poor.

Table 5 shows wide variations in the prevalence of overweight among regions and age groups. Overweight increases with age. The highest prevalence among chil-

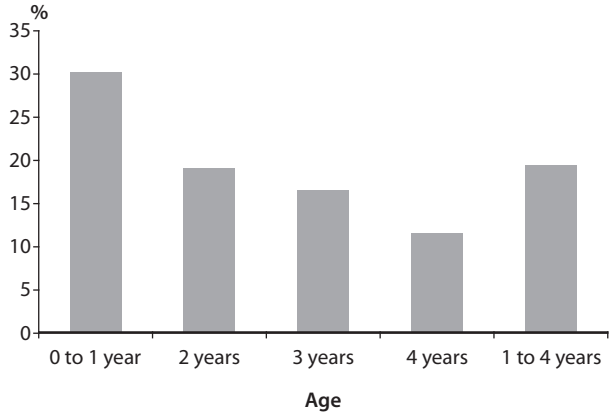

Figure 1. Prevalence of anemia in children from one to four years old*.

* Only data from the 2006 EncoPrevenimss survey are showed in the figure. Source: Encoprevenimss 2006.

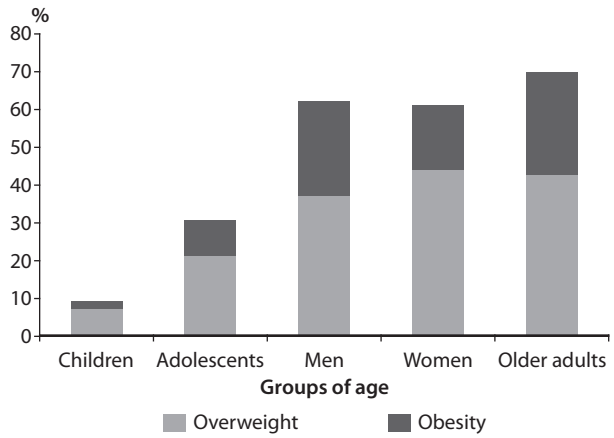

Figure 2. Prevalence of obesity and overweight in each age group*.

* Only data from the 2006 EncoPrevenimss survey are showed in the figure. Source: Encoprevenimss 2006.

dren occurred in the Southeast region, while the North region had the highest prevalence for the other age groups. Obesity was more frequent in the South and Southeast regions.

Geographical prevalence of Type 2 diabetes mellitus and hypertension Table 6. The table shows the prevalence among individuals that were diagnosed previously and among those that were found as a result of the survey. For type 2 diabetes, the prevalence increases with age and the highest prevalence was found in the Southeast states. As for hypertension, the prevalence of this condition increases

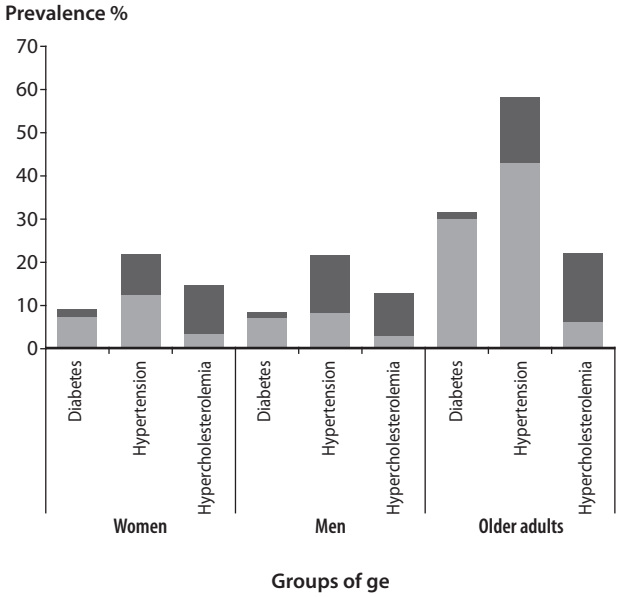

Figure 3. Prevalence of type 2 diabetes, hypertension and hypercholesterolemia: Patients already diagnosed and those identified in the survey*.

* Only data from the 2006 EncoPrevenimss survey are showed in the figure. Source: Encoprevenimss 2006.

with age and an important proportion of individuals did not know about their condition. The highest prevalence was observed in women and older adults interviewed in the Northern states.

Discussion

PREVENIMSS' main goals were to increase coverage of preventive services based on health needs. The main findings of these surveys are the continuous increase of the coverage of preventive actions in the five age groups, and the ascertainment of the magnitude of old and emergent unmet needs among IMSS members, such as the high prevalence of anemia among children aged 0-4 years; the significant proportion of undiagnosed cases of hypertension in women, men and older adults and the proportion of people with overweight and obesity.

The coverage of preventive programs that were operational before the onset of PREVENIMSS was the highest since the first survey: Among children these were: measurement of height and weight, completed schemes of vaccination in children < 5 years old and congenital hypothyroidism detection in newborns. Preventive actions in women were, screening for cervical cancer; for women,

Table 5. Prevalence of overweight and obesity in each region of the country and age group

Condition/Age group	North %	Center %	South %	Southwest %	Mexico City %	National %
Overweight						
Children	8.1	7.1	13.6	9.6	3.7	7.5
Adolescents	24.2	18.3	21.4	26.2	21.7	21.3
Women	40.6	36.1	40.3	36.4	34.5	37.1
Men	48.9	42.9	48.7	47.8	36.9	44.2
Older adults	44.2	41.8	41.0	43.3	43.2	42.7
Obesity						
Children	2.5	1.6	4.6	2.7	0.5	2.0
Adolescents	11.2	8.2	11.7	15.2	5.7	9.6
Women	29.4	23.6	27.6	32.8	16.1	25.0
Men	18.2	17.3	22.5	22.8	8.2	17.1
Older adults	31.4	25.3	30.5	32.1	21.0	27.2

Source: ENCOPREVENIMSS 2006.

Table 6. Prevalence of Type 2 diabetes mellitus and hypertension among women, men and older adults in each region of the country

Condition/ age group	Finding %	North %	Center %	South %	Southwest %	Mexico City %	National %
Type 2 diabetes							
	Previously diagnosed	7.9	6.2	6.5	10.6	7.2	7.4
Women	Finding in survey	1.8	1.8	1.2	1.9	1.1	1.7
	Total	9.7	8.0	7.7	12.5	8.3	9.1
	Previously diagnosed	6.5	6.4	7.5	10.6	6.9	7.2
Men	Finding in survey	1.1	1.2	2.0	0.7	1.2	1.1
	Total	7.5	7.6	9.5	11.3	8.1	8.3
	Previously diagnosed	30.7	29.5	25.7	32.1	30.4	30.0
Older adults	Finding in survey	1.3	1.6	2.5	1.3	1.9	1.6
	Total	32.0	31.1	28.2	33.4	32.3	31.6
Hypertension							
	Previously diagnosed	13.8	11.0	13.0	18.9	9.3	12.5
Women	Finding in survey	13.6	9.1	10.1	8.1	6.9	9.5
	Total	27.4	20.1	23.1	27.0	16.2	22.0
	Previously diagnosed	7.8	7.7	11.0	11.4	6.3	8.2
Men	Finding in survey	17.5	12.5	11.2	14.6	9.2	13.2
	Total	25.3	20.2	22.2	26.0	15.5	21.4
	Previously diagnosed	43.1	43.3	34.0	41.6	46.9	43.0
Older adults	Finding in survey	18.9	16.2	19.7	15.0	7.4	15.4
	Total	62.0	59.5	53.7	56.6	54.3	58.4

Source: Encoprevenimss 2006

men and older adults: type 2 diabetes and hypertension and pneumococcal vaccine for older adults.

Measuring coverage is particularly relevant to evaluate performance of individual programs within health systems and of individual countries regarding major international initiatives, such as the Millennium Development Goals (MDG). Mexico is on track to achieve the MDG-4 (two-thirds reduction between 1990 and 2015 in deaths of children under five years)[8] and the coverage of preventive actions that IMSS has achieved with its members is an underlying factor of these results, given the size of the population this institution covers.

A conceptual model has been proposed for assessing interventions to improve preventive services. This model comprises seven intervention components (reminders, feedback, education, financial incentives, regulatory interventions, organizational change and media campaign), four potential targets (patient, provider, organization and community) and key intervention features applicable to most of the intervention components (social influence, marketing, outreach, visual appeal, collaboration and teamwork, theory based, top management support and active learning strategies).[17]

We analyzed PREVENIMSS using this framework to identify its strengths and limitations. PREVENIMSS implemented several intervention components: reminders (through the booklets that address preventive activities), education (through educational activities aimed at promoting the use of preventive services); regulatory (through modifying the norms, regulations and criteria to provide preventive care); organizational change (through integrating all scattered preventive programs within a single strategy) and media campaign (through advertisements in radio, newspaper and television). The potential targets were, users, providers and the organization at central, district and local level. No financial incentives were considered as part of the intervention, neither actions promoting community participation were implemented as part of the program.

PREVENIMSS is the outcome of organizational changes that could be considered planned and developmental.[18] It was planned because it was deliberate, based on conscious reasoning and actions. It was developmental because it aimed at improving or correcting the processes to provide preventive care. Its design considered the demographic and epidemiological patterns of IMSS members and the IMSS' organizational strengths and weaknesses. This approach allowed defining the organizational changes that would contribute in assuring the implementation and sustainability of the program.

The finding of the high rate of anemia (19%) in children under four years of age, confirms what has been reported in other surveys carried out among the IMSS affiliated population (20.5%);[19] the consequences of iron deficiency in the development of children have been widely described. This finding should be a wake-up call to analyze this situation in detail and to develop sound strategies aimed at tackling this problem. It is worth mentioning that IMSS members belong to the formal sector, which represents a regular income; thus, they are able to purchase food and commodities. It is also possible that certain socio-cultural factors like the dietary habits of children could have a negative influence on the possible impact of iron supplementation. Further studies are needed to address this topic.

Regarding the suffering from chronic conditions, ENCOPREVENIMSS reported that a significant proportion of interviewees were unaware of having either hypertension or diabetes. This suggests that PREVENIMSS must increase its screening activities in order to identify and diagnose cases for timely treatment. The interest in reinforcing preventive care for chronic diseases is due to its consequences for the individual and for the family, but also because these are high cost diseases that increase the burden for health care systems and for the society. Preventive services can contribute to avoid premature deaths and save resources.

The high rates of overweight, obesity, type 2 diabetes, and hypertension among interviewees mirrors what is observed in the actual provision of care; these are the main causes of visits to IMSS primary care facilities and among the chief causes of hospitalization. The growing burden of these conditions already represents a heavy toll for health systems.[20]

The analysis of the geographical distribution of the prevalence of overweight, obesity, type 2 diabetes and hypertension showed important regional differences that allow making several assumptions. The percentage of individuals that did not know about their condition reflects an unmet need for preventive care. It is reasonable to assume a proportion of individuals without screening in a given year; however, given the magnitude of these conditions, this proportion should not be high. The analysis of the capacity to provide preventive care along with the knowledge about the actual demand and the information at local or regional level are necessary elements to estimate the actual and potential coverage and to set regional relevant goals for screening and to reinforce preventive actions in targeted age groups. Also, the geographical

variations would indicate that certain socio-demographic conditions, such as income, access to food and lifestyle might have an important influence.

To interpret the findings of the surveys it is important to consider two main limitations in the design and focus of the evaluation.

1) *The non-response rate as a source of bias*. To compensate for the non-response rate we carried out two actions: a) To draw a larger sample size than needed (10%) and b) to replace the non-respondent households. However, the decision of replacing the household is a non-sampling error that carries out several potential problems, because the attempts to substitute non-responding households are time-consuming, prone to errors and a source of bias.[21] Given that the extent of non-response rate was below 10% in the four surveys, we may assume that this reduces the bias.

This strategy was focused to obtain an efficient sample design. The use of clusters allowed controlling costs and we aimed at maintaining the design effect as low as possible. It is well known that the default value for the design effect should be of 1.5 to 2.0, but this implied a considerable increase in the number of households and in the costs. We used a feasible number of clusters, within each, the smallest cluster size in terms of the number of households and this number was constant. It was also considered the information of previous surveys carried out in Mexico.

2) *The surveys were not designed to measure or to evaluate the organizational change at the family medicine clinics*. This shortcoming should be addressed in the short term and evaluating the organizational changes will provide key information to improve PREVENIMSS performance.

3) *The survey did not collected information about the diphtheria-tetanus vaccine*. This vaccine is routinely applied and the IMSS information system reports acceptable coverage figures however we should accept that this information should be included as part of the data.

Prevention is gaining attention in the international arena. In 2005, to address prevention and control of chronic diseases, the World Health Organization published a stepwise framework that comprises three core steps: 1. Estimate population needs and advocate for action, 2. Formulate and adopt policy, 3. Identify policy implementation steps. In a broader sense, IMSS actions that began in 2001 are similar to what WHO advices; PREVENIMSS identifies population needs and addresses the prevention component, while curative services, including primary care and hospital care are in charge of the control component. Theoretically, this is the right way. However, in a complex healthcare system, continuity and coordination of care between preventive and curative care, and among levels of care, requires strong advocacy and profound organizational changes.[22]

The opportunity cost of preventive programs must be taken into account when designing health policies. Despite the potential benefits of preventive care, the fact is that most of primary care services are focused on providing curative care. Health policies in Mexico are oriented towards increasing coverage of health care and universal access. From our perspective, the focus should be to provide universal access to primary care services, which in turn comprises reinforcement of preventive services and provision of therapeutic care. The rational for this recommendation is straightforward: preventive care aims to avoid or delay the occurrence of diseases, to detect timely a disease, to avoid or delay complications when the condition is already present, to avoid premature deaths and to save resources. In fact, given that preventive care is appropriate for all, its provision is the first step to provide universal coverage, which in turn contributes in improving population health and reduces health disparities.

The rise in chronic diseases and the aging of the population are prompting decision makers and healthcare systems to look for prevention strategies that would help cope with this growing problem.[23] The impact of prevention services is not negligible; the financial resources saved can be used to pay for highly complex and more costly medical problems,[24] yet this is an ongoing research field.[25] The resources allocated for preventive activities are far from enough and much more investment is needed. The aim is not to privilege preventive care over curative care, but to find the optimal balance between these forces while looking for cost-effective alternatives.

Analyzing the actual impact of PREVENIMSS on institutional performance is advisable. PREVENIMSS has already increased the demand for preventive care, which is due to both, changes in the organization that facilitated access to preventive services and users' demand as a result of the media campaigns and the information that was given personally when the users received the PREVENIMSS booklets. The increase in screening of diseases such as cancer, hypertension and diabetes will put further pressure on curative services to confirm the diagnosis and to provide timely and appropriate treatment to those already ill. This requires careful planning and reinforcement

of current health services infrastructure to fulfill potential demand; currently there is no evidence of the impact of this increase on the actual provision of services.

Evaluating the impact of preventive actions would provide evidence of the cost-benefit of reinforcing prevention. To date there is no conclusive evidence of the benefit of preventive care for specific conditions. The analysis of the U.S. Preventive Service Task Force pointed out the lack of evidence on the health benefits of detecting type 2 diabetes, but it accepts that the benefits can be observable for hypertensives.[26] In fact the benefit of individual interventions, for example vaccines, screening of specific diseases or interventions aimed at improving lifestyle should be carefully analyzed from different perspectives. An adequate approach could be to measure effective coverage of preventive actions. Although, the significance as well as the difficulties and limitations in measuring effective coverage in Mexico have been addressed previously.[27]

Conclusion

After five years of its implementation, PREVENIMSS showed an important increase in coverage for the principal components of the program, and its working model could be applicable to reinforce nationwide preventive programs. The unsolved problems such as anemia, and the emerging ones such as overweight, obesity, among others, point out the need to strength preventive care through designing and implementing innovative programs aimed to attain effective coverage for those conditions in which prevention obtains substandard results

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Authors' contributions

GG, OM and SL contributed in developing the PREVENIMSS program; GG, HR, BA and SFC developed and conducted the surveys and carried out the statistical analysis of ENCOPREVENIMSS. RPC and HRM conceptualized and wrote the paper. All authors critically edited the manuscript, participated in the interpretation of data and read and approved the final version.

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Economic consequences of epidemiological changes in diabetes in middle-income countries: the Mexican case*

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The identification of financial requirements for chronic diseases is necessary for a rational allocation of resources.[1,2] In the case of diabetes, the economic burden of the demand for health care services constitutes one of the main challenges to the individual, society, and the health care system, particularly to this system's public institutions.[3] Studies exist in which estimates of direct and indirect costs of diabetes provide conclusive evidence of both the challenge involved in the identification of economic requirements to satisfy the demand for services related to this health care problem as well as the challenge involved in the search for the most rational way to provide these health care services. [4-5]

In the case of countries with middle incomes, this takes on added relevance because, as has been pointed out by certain authors, services for diabetes and other chronic diseases are on the rise and compete, in a context of scarce economic information for decision-making, with demands from and resources directed to infectious diseases.[6-7]

Estimates of direct and indirect costs of diabetes are being generated in several health care systems around the world, with diverse results depending on the method used and on the health complications included in the evaluations.[8-9] These studies set forth the need to evaluate the existing economic impact and to estimate the financial requirements for more rational and efficient decisionmaking in the management of financial resources, depending on the characteristics of the national health care systems.

In the case of Mexico, health care services for diabetes have a demand and costs that are differentiated by the type of institution, which is a characteristic of health care systems in most middleincome countries. Thus, direct and indirect health care costs, as well as financial requirements for diabetes, also differ according to the institutions constituting the health care system. The Mexican health care system was formed, from the beginning, with a component of public institutions in order to offer health care services to both the uninsured population, who had no salaries and scarce economic power (Ministry of Health, or Secretaría de Salud [SSA]), as well as the insured population, represented by salaried workers from the formal economy (the Mexican Social Security Institute, or Instituto Mexicano del Seguro Social [IMSS], and the Institute for Social Security and Services for State Workers, or Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado [ISSSTE]). The other component of the health care system refers to the private sector, with a broad array of

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institutions offering health care services to the population with purchasing power. [10-11]

The present study determines direct and indirect costs attributable to type 2 diabetes within the three most important public institutions in Mexico: the Ministry of Health (SSA), the Mexican Social Security Institute (IMSS), and the Institute for Social Security and Services for State Workers (ISSSTE). Later, we present and discuss results on epidemiological changes expected for the next 3 years as well as results on the financial requirements for diabetes at the institutions under study.

Research design and methods

Direct costs of health care services were obtained from the management of standardized cases, adjusted by type of institution. The cost-evaluation method was designed according to an instrumentation technique that identified production and supply functions for each case management, a diagnostic-related group variant adjusted for Mexico.[12] Eight tools were used to establish costs per production function, which were concentrated in cost-evaluation matrices, according to the institution.

Case management was defined for an average case with the corresponding adjustments for each institution. For each disease and event to be evaluated, management of the average case was defined on the basis of the disease's natural history and the results of shadow study reviews. The point of view of a group of expert clinicians and administrators was considered in order to obtain a homogeneous opinion of how to manage each case. These definitions refer to the demand of hospital or ambulatory services, according to each disease.

As explained above, standard management was defined per disease/event to be cost evaluated, considering the natural history of the disease, results found in the clinical files review and the shadow study, and the opinions of a group of expert clinicians and administrators. Results obtained depended on hospital or ambulatory management, the case, and the institution's regulations.

Direct costs refer to all monetary resources required to satisfy health care services demanded by users; these included consultation/diagnosis, drugs, hospitalization, and treatment of complications. Following the human capital approach to calculate indirect costs in Latin America,[3-13] the model included three categories of monetary costs attributable to type 2 diabetes in three public institutions: mortality costs, cost of permanently disabled patients, and cost of temporarily disabled patients. The annual demand for health care services for diabetes was calculated from the number of cases being treated, adjusted by type of institution.

This information was obtained from the statistics bulletin on health impairment of the National Health System, 1989±2002.[14,15]

To determine the financial requirements, a time series was performed from 1989 to 2002, with a probabilistic design according to the Box-Jenkins technique,[6] using a 95% CI with P_0.05. Analysis variables included changes in morbidity for the study period and changes in health care policies and programs for diabetes and chronic diseases. The following methodological phases were considered in the development of the probabilistic models: identification, estimation, diagnostic check, and prediction.

The resulting models for estimating the expected demand of diabetes have an average movement operator of order 1. As in other studies with similar methods,[17] the basis of each model was to include people who received a diagnosis of type 2 diabetes as well as costs of annual hospital or ambulatory management at one of the three institutions under study. We should emphasize that the projection period was limited to 3 years because previous studies have advised against using periods _4 years because they may cause budgeting uncertainty. To calculate costs and financial consequences caused by changes in both the epidemiological profile and the demand by type of institution, an inflationary index projected to 2005 was developed and applied, based on the Banco de Mexico's price index for conconsumers. Results are in Mexican pesos and U.S. dollars, at the exchange rate of 1 U.S. dollar _ 9.35 Mexican pesos, corresponding to January 2003.[18]

Results

Figure 1 shows the estimated direct, indirect, and total costs of type 2 diabetes. This included all people and was only for health care costs that will be demanded of the three main public health care providers in Mexico, up to 2005; it does not include costs of health care demand for diabetes in the private health care sector. The overall contribution of direct costs was 45% of total costs, and indirect costs were 55% of total costs. Regarding the four categories of estimated direct costs, results were: consultations/diagnosis 11.64%, drugs 38.77%, hospitalization 11.64%, and complications 32.18%. With respect to the three estimated categories of indirect costs, the results were: mor-

Figure 1. Direct, indirect, and total costs attributable to diabetes in three main public institutions of the Mexican health care system (in U.S. dollars, year of estimation 2005).

Item	SSA	IMSS	ISSSTE	Total Cost
DIRECT COSTS				
Consultations/diagnostic	6,455,557	14,571,899	3,409,364	24,436,820
Drugs	14,375,755	32,499,886	7,592,250	54,467,891
Hospitalization	4,316,064	9,742,498	2,279,437	16,337,999
Treatment of Complications	11,932,212	26,934,156	6,301,740	45,168,106
Retinopathy	(1,312,543)	(2,962,757)	(693,191)	(4,968,491)
Cardiovascular disease	(1,193,223)	(2,693,415)	(630,174)	(4,516,810)
Nephropathy	(8,710,514)	(19,661,936)	(4,600,272)	(32,972,722)
Neuropathy	(429,559)	(969,629)	(226,862)	(1,626,050)
Peripheral vascular disease	(286,373)	(646,419)	(151,241)	(1,084,033)
Total direct costs	**37,079,587**	**83,748,439**	**19,582,796**	**140,410,816**
INDIRECT COSTS				
Mortality cost	2,061,476	4,842,457	1,106,427	8,010,360
Cost of permanently disabled patients	42,898,783	100,770,247	23,024,472	166,693,502
Cost of temporarily disabled patients	647.632	1,521,302	347.594	2,516,528
Total indirect costs	**45,607,891**	**107,134,006**	**24,478,493**	**177,220,390**
TOTAL COSTS				
Direct and indirect costs	**82,687,477**	**190,832,445**	**44,061,284**	**317,631,206**

Data were calculated using 95% CI with the Box-Pierce statistical test (P _ 0.05). The exchange rate was 1 U.S. dollar _ 9.35 Mexican pesos, corresponding to January 2003. The source for the data was Arredondo A, et al.: Costos y Consecuencias Financieras del Cambio en el Perfil Epidemiolo gico en Me´ xico. INSP-Universidad de Montreal-Internacional Development Research Centre, 1999. Actualizacio´n de Modelos Probabilisticos, January 2003.

tality costs 4.52%, costs of permanently disabled patients 94.06%, and costs of temporarily disabled patients 1.42%.

With respect to the costs of complications, the five estimated categories were: costs of retinopathy 11%, costs of cardiovascular disease 10%, costs of nephropathy 73%, costs of neuropathy 3.6%, and costs of peripheral vascular disease 2.4% (Fig. 1). Going into detail about costs, from these results it was possible to establish minimum and maximum ranges of financing requirements at the three most important health care institutions. The cost of a hospital case ranged from $613.71 to $887.14, with the lowest at the SSA and the highest at the IMSS. The same trends were observed for costs of ambulatory cases.

Regarding the effect of the expected epidemiological changes in hospital and ambulatory service demand for 2003± 2005, the results are shown in Fig. 2. An increase is expected, although the results show a greater increase for hospital cases. As shown in Fig. 2, the increase tends to be higher among the insured when compared with the uninsured population. Figure 3 shows the trends in the economic resources needed to finance the minimum service demanded by the population. To cover service demand by diabetes patients, IMSS requirements will increase from $78,813,110 to $83,689,444; for the ISSSTE they will increase from $17,670,392 to $19,582,796; and for the SSA they will increase from $33,038,568 to $37,079,578.

Figure 2. Expected cases for the period 2003–2005 by type of demand and institution.

Type of demand/ Institution	Year		
	2003	2004	2005
SSA			
Total cases	301.172	314.698	338.009
*IC	(298,867-303,477)	(311,598-317,798)	(330,409-345,009)
Hospital case	30.117	31.469	33.801
Ambulatory case	271.055	283.229	304.208
IMSS			
Total cases	393.279	399.402	417.612
*IC	(389,369-397,189)	(393,801-405,003)	(410,412-424,812)
Hospital case	55.059	55.916	58.466
Ambulatory case	338.22	343.486	359.146
ISSSTE			
Total cases	125.607	130.111	139.201
*IC	(122,996-128,218)	(126,123-134,099)	(134,576-143,826)
Hospital case	15.073	15.613	16.704
Ambulatory case	110.534	114.498	122.497

The source for the data was Arredondo A, et al.: Costos y Consecuencias Financieras del Cambio en el Perfil Epidemiológico en México. INSP-Universidad de Montreal-Internacional Development Research Centre, 1999. Actualizacio´n de Modelos Probabilisticos, January 2003. *95% CI with the Box- Pierce statistical test (P _ 0.05).

Increases in the resources required for hospital or ambulatory case management followed along similar lines.

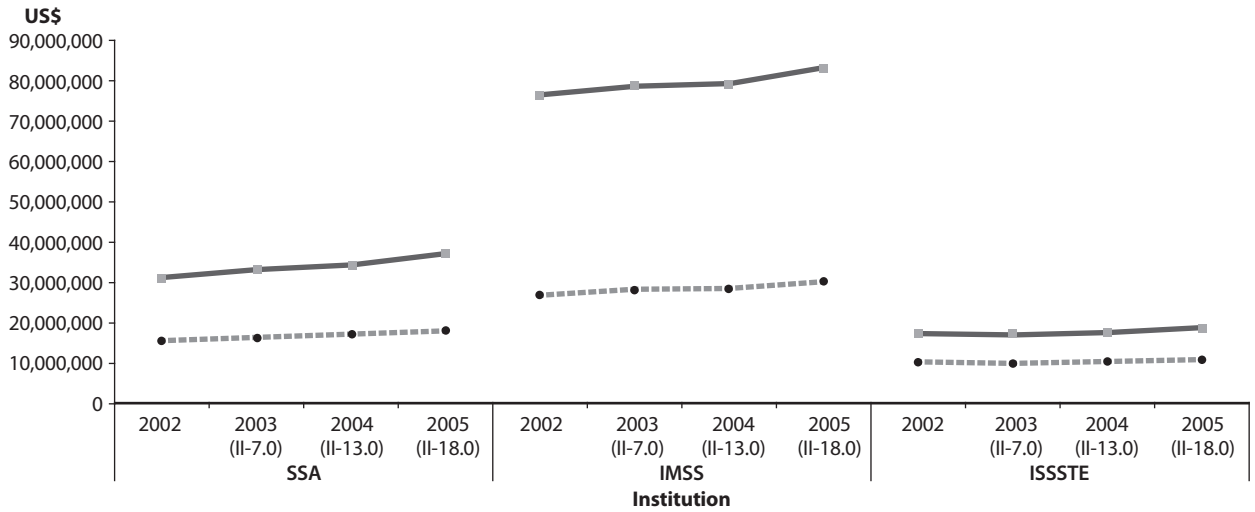
When comparing direct costs for different health care models, depending on the disease and the institution, results were as follows: for hospital cases of diabetes, the IMSS will pay the highest cost, followed by the SSA and ISSTE, with a lower direct cost (Fig. 4). The same trend is observed in relation to direct costs for ambulatory care. The highest average direct costs per managed case, as well as the economic impact of the global management of diabetes for 2003±2005, were found at the IMSS. Indirect costs showed a similar trend for the three institutions, representing 30% above the total direct costs. Financial requirements for ambulatory and hospital care represent_4.7% of the total budget assigned to the uninsured population and 6.5% of that allocated to the insured population.

The economic consequences for insured and uninsured populations also have a different impact with respect to the total budget for both population groups. For the low-income uninsured population (40% of all Mexicans), in recent years health care expenditure was on average 15% of the total, whereas for the insured population (50% of all Mexicans), health care expenditure was 43% of total expenditures.[19] According to the results of our study, including resources required for hypertension, of the total financial burden for annual management of cases of diabetes and hypertension, 25% will be for the uninsured and 75% for the insured population.

Conclusions

In this study we estimated the costs of type 2 diabetes for the three main public institutions that provide health care in Mexico. We also estimated the financial requirements for the next 3 years, taking into account the expected changes in the epidemiological profile of diabetes in Mexico.

Figure 3. Financial requirements to satisfy health care service demand by type of institution, comparing diabetes versus hypertension. The reference period was 2002–2005 (in U.S. dollars).



Data were calculated using 95% CI with the Box- Pierce statistical test (P _ 0.05). The exchange rate was 1 U.S. dollar _ 9.35 Mexican pesos, corresponding to January 2003. Il, index of inflation (projected for the period 2003–2005). The sources of information were ref. 18 and Arredondo A, et al.: Costos y Consecuencias Financieras del Cambio en el Perfil Epidemiolo´ gico en Me´xico. INSP-Universidad de Montreal- Internacional Development Research Centre, 1999. Segunda Actualizacio´n de Modelos Probabilisticos y de los Costos de Manejo de Caso, Enero del 2003. _, diabetes; u, hypertension.

Figure 4. Direct costs and financial requirements to satisfy the demand for health services by attention model and type of institution for expected cases of diabetes. The reference period was 2003 versus 2005 (in U.S. dollars).

Attention model	2003			2005 Ii=20,0		
	SSA	IMSS	ISSSTE	SSA	IMSS	ISSSTE
Attention model: hospital	18 672 664,00	49 387 976,00	10 264 604,00	20 956 558,00	52 443 715,00	11 375 505,00
Attention model: ambulatory	14 365 904,00	29 425 134,00	7 405 788,00	16 123 029,00	31 245 729,00	8 207 291,00
Both models of attention	33 038 568,00	78 813 110,00	17,670 392,00	37 079 587,00	83 689 444,00	19 582 796,00

Data were calculated using 95% CI with the Box- Pierce statistical test (P _ 0.05). The exchange rate was 1 U.S. dollar _ 9.35 Mexican pesos, corresponding to January 2003. Il, index of inflation (projected for the period 2003–2005). The sources of information were: ref. 18 and Arredondo A, et al.: Costos y Consecuencias Financieras del Cambio en el Perfil Epidemiolgico en Mexico. INSPUniversidad de Montreal-Internacional Development Research Centre, 1999. Actualizacio´n de Modelos Probabilisticos, January 2003.

The estimated costs of our study reported a total of $317 million, $140 million in direct costs, and $177 million in indirect costs. With respect to the cost results, several studies in Mexico on the cost of diabetes reported $100 million in direct costs and $330 million in indirect costs.[20] Another recently published study reported $1.9 billion in direct costs and $13.1 billion in indirect costs. There are differences between our results and those of previous studies because of differences in the estimates of the prevalence of diabetes used in the developed models and

because our study only reported costs of type 2 diabetes for the three main public institutions.

With regard to the out-of-pocket expenses for diabetes, we have to highlight this situation in Mexico. In terms of other costs for the control and follow-up of ambulatory management of diabetes, the use of financial resources attributable to direct user expenditures is a considerable contribution to the annual cost of case management. In Mexico, users must make direct out-of-pocket payments, which are relatively considerable, for control studies, monitoring, group therapy, diabetes education, etc. Although this affects all users of the health care system, this cost has a greater impact on uninsured users. Because the infrastructure needed to carry out studies is not always available, these users have to take on the cost of these studies, without being reimbursed by the health care system.

This has important repercussions in terms of quality of care. The health care system proposes integral management of the diabetic patient, including monitoring, control and follow-up with laboratory studies, health education, group therapy, etc. However, in view of the lack of infrastructure in the system, the patient is the one who finally determines his/her ambulatory care, making integral management more difficult. For this reason, the quality of care with which diabetic patients are managed requires adjustments and corrections to improve this quality and decrease the financial impact on the user's pocket.

With respect to the epidemiological changes expected for diabetes and their effects on financial requirements, we should point out that financial pressure will not only depend on the changing disease epidemiology but also on the type of population to be served. For example, in the case of insured patients at the IMSS, the demand for services for diabetes is much lower than the demand for other chronic diseases such as hypertension. Health care needs for patients with diabetes only at the IMSS are almost the same as those at the SSA; however, they are much greater than the corresponding service needs for insured patients with diabetes at the ISSSTE. On the other hand, if risk factors and the different ambulatory and hospital care models remain more or less as they are in the three studied institutions, the financial burden will be higher for the IMSS, followed by the SSA and then the ISSSTE.

The repercussions of all of the above will have a greater relevance for health care services for the uninsured because the pressure of inequality in resource allocation will be added to that caused by the relatively large increase in service demand for chronic or degenerative diseases. These services will be part of the popular health care insurance that the present national health care program (2001±2006) intends to implement for the low-income population with no social security coverage.[21, 22] In terms of the financial pressure generated from both, the epidemiological changes and changes required in the new health care programs will present different challenges for health care planning at all three institutions. For example, expected financial consequences suggest the need to redesign and invest more in programs for health promotion and prevention in order to reduce demand for hospital services and promote treatment of diabetes in an ambulatory setting. The greatest challenge will be for the social security services because, since their creation, these services have received the greatest amount of funding for treatment and rehabilitation programs.

Estimations of financial requirements are basic information for strategic planning. The financial consequences of the expected epidemiological changes are a basis and justification not only for more investment in diabetes or management of chronic diseases but also for the allocation of more resources for their prevention, thus minimizing and controlling the disease and lessening the economic burden on the health care systems of middleincome countries. This means that despite our evidence for the need to increase health care expenditures, the present economic situation does not seem to favor this and instead points to a decrease in health care expenditures, not only for 2003 but at least until 2005.

In terms of the validity of our results, it is important to highlight that, in relation to epidemiology, the expected results were validated by reference to trends established during the previous 10 years. The models used in our projections were similar to those in the statistics bulletin of the National Health System for 1990± 2002. The number of expected cases follows trends that are similar to those projected by the International Diabetes Federation for Latin American countries. [23] Case management costs are within the management range of diabetes found in previous studies at the national and international level.

We show that the models are internally valid and predict direct and indirect costs and financial requirements for the next 3 years. These results and the relative weight of each category of costs (complications, hospitalization, mortality, disability, etc.) are consistent with those observed in the reference population and institutions under study. We extrapolate the results only to the costs of diabetes in public institutions because we recognize that it is much more difficult to prove external validity without

data on the entire health care sector, particularly when we do not have access to data in the private sector. The models developed in other studies[24-25] are intentionally conservative and are unlikely to overestimate the economic impact of diabetes.

On the other hand, it is important to emphasize that studies in the U.S.[26] and Canada[27] reported that direct costs are higher than indirect costs. In our results, as we showed before, they were similar: direct costs accounted for 45% and indirect costs for 55% of the total costs. As we have seen in other studies on the economic impact of diabetes, our study has limitations basically because of the methodological difficulties found in developing probabilistic models in countries where there is no access to (or an absence of) data, particularly from private institutions.

Despite the above-mentioned limitation, results reported several relevant aspects of the diabetes problem: in the first place, if risk factors and health care programs for the main public institutions continue as they are in 2003, the economic burden of direct costs to satisfy future demands of health care services will go beyond the resources these institutions have allocated for diabetes. In the second place, the economic burden represented by indirect costs is a challenge that should be faced by individuals, society, and the health care system as a whole. In other words, the indirect cost of the diabetes problem establishes the need to involve different sectors of society with a greater commitment to action.

Finally, total reported direct and indirect costs set forth, as challenges to be solved, the prevention of diabetes and its complications within the health care sector as well as in other sectors, particularly that of education. As actions to be taken to face these challenges, we propose the following strategies: a greater investment of financial resources allocated to prevention in order to decrease the burden attributable to complications and new cases of diabetes; a greater rationality by type of institution in the allocation and use of financial resources for diabetes; and, just as importantly, a greater promotion of educational programs directed toward the general population, and particularly for the population with diabetes. These programs should be promoted and coordinated by the health care sector, but with strong and ample participation of various social actors (nongovernmental organizations; researchers; other sectors from federal, state, and municipal government levels; community leaders; and users).

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Evidences on weaknesses and strengths from health financing after decentralization: lessons from Latin American countries*

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Introduction

During the past 10 years, most Latin American countries have implemented extensive reforms of their health systems, reforms characterized by different strategies in the delivery and financing of health services. In this context, decentralization like one of the principal strategies of health care reform has become an increasingly familiar theme in development theory and practice over the past decade. However, the literature on decentralization has tended to concentrate on case studies and theoretical discussions rather than on empirical analysis, and few studies have explored the practical consequences and particularly the effects of decentralization on health financing (Braveman and Gruskin, 2003; Hurley, 1995; Parada et al., 2000).

Increasingly it has been recognized, at both national and international levels, that management, financing, planning and policy functions in the health sector may be carried out more efficiently and effectively if they are decentralized, transferring responsibility to a local level. However, there is growing concern that decentralization has failed to achieve the objectives for which it was introduced and can indeed have effects that limit health sector development (Arredondo and Parada, 2003; Bossert et al., 2003). The relationship between decentralization and financial changes in the process of health care reform in Latin American countries is complex. Analysis of recent attempts at decentralization and financial changes requires an understanding of the contradictory forces at work within the political systems, and particularly the bureaucracies, of Latin American countries (De Souza et al., 2000). In these countries strong centralizing tendencies coexist with particular forms of bureaucratic decentralization (Gallardo and Beeharry, 2002; Arredondo, 1997). Centralizing tendencies remain predominant, with decentralizing forces both being caused by and serving to reinforce them.

The type and degree of decentralization is strongly influenced by dynamic financial aspects, including sources of finance, agents, providers, final destination and mechanisms of finance allocation at the local, regional and national level. Local governments usually have authority to levy taxes. However, in developing countries, much of the national revenue comes from indirect taxes, especially customs and excise revenues, while buoyant local sources of revenue are hard to find (Collins and Green, 1994; Abel-Smith and Dua, 1988; Sassi, 2001). The local governments in these countries are often by necessity hea-

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vily dependent on grants from the central government. In addition, governments often retain central control over finance in order to promote geographical equity. The sources of finance of local government may therefore not differ significantly from those of local offices of central ministries, although the way the grant is made is likely to differ (Quentin, 2004; Horvath, 2003).

Many Latin American countries have tried to decentralize their health care systems. A number of different approaches have been taken, with varying results that reflect strengths and weaknesses for each country (Murray et al., 1999). The results are strongly related to changes made in the mechanisms for allocating financial resources, especially the new financing dynamics for health services in the context of health care reform (Bossert, 2002). The financing study of health care decentralization quantifies the resources involved and analyses the dynamics of the sector, its opportunities and sufficiency. At the same time, the study suggests ways to mobilize and reassign resources within the system at a national and regional level (Khaleghian, 2003; Aguinaga, 1997). The financial changes for decentralization have been made according to the current state of health financing. For Latin American countries, public treasury funds are the principal source of financing for central and local government health spending. In addition, compulsory contributions of employers and employees to social security systems or health and welfare funds are the major sources of financing for expenditure on social security health care programs (Cassels, 1995).

In Mexico, budgetary resources have been reallocated in several ways. Although total federal government expenditure on health has been reduced, the proportion assigned to the health sector has increased in recent years (Álvarez, 1990). Analysing the delegation of finances in the decentralization of health services in Mexico two constant factors emerge, setting a common pattern between decentralized and centralized health service organization (SSA, 2004). First, the continuation of separate federal and state sources of finance, without the state meddling with the federal funds (Parada et al., 2000); and second, the maintenance of the federal labor relationship with all state health workers, right up to the Director or Minister of Health. Thus, all decentralized state health services, whether called ministries, departments or institutes became, from the point of view of finance and control, de facto parastatal organisms of both the state and the federal governments (González, 1992).

In Peru, through regional secretariats for health services and municipal clinics there is now considerably more local autonomy, and greater financial and administrative decentralization. Regional secretariats and municipal clinics have their own legal status, control staff and possess their premises and equipment. The directors of these units, who may or may not be health professionals, have been given wide powers to manage the health facilities, staff, equipment and budget. In addition, the management support for municipal clinics and regional secretariats has been strengthened by new sections responsible for finance. The regional authorities did not press for financial devolution, as this would have implied greater responsibility than they could cope with. In spite of fiscal and administrative reforms made to strengthen regional governments' revenues, their share of federal fiscal appropriations is still meager and awkward in its application, and their tax bases are also weak (Priale´, 2004).

In Nicaragua, the constitution states very clearly how the national health system should be organized. The structure designed for the health sector is completely coherent with the federal structure of the Nicaraguan state, with three autonomous spheres of power. A decentralized health system, with only one authority in each sphere of power, seems appropriate. Moreover, decentralization and community participation are explicitly mentioned as directives that the national health system must follow. The only political units in the country that provide health services to the population are at a county level, with some national units. The federal and state governments must provide the necessary financial resources and technical cooperation to ensure that their obligation to health is executed. Since 1986, the implementation of health care decentralization in this country has been seriously obstructed by political changes in the federal government. The lack of policies to strengthen the ability of counties to execute their new functions has seen their weaknesses used as a barrier to implementing decentralization. Also, the lack of a data base of the national health accounts, with which an analysis could be coordinated, has hampered decision making for health care financing in the context of decentralization (MINSA, 2003).

In summary, the tendencies both to centralized financial authority and decentralized administrative authority coexist in the health systems of Latin American countries. In a complicated and often seemingly confused manner these tendencies combine and conflict with one another, with the centralizing tendency remaining unquestionably dominant (Cercone, 2004). Moreover, this centralizing tendency results in the over-concentration of decision making at the top of the hierarchy and, in turn,

generates decentralizing efforts aimed at decongesting the overloaded apexes of decision making within central ministries of health. In this environment, the possibilities for devolution of financial power from central bureaucratic agencies to local health units are not very favorable. In this sense, any financial issue for health care decentralization is related to the new local level financial authority and the control at a local level of the sources of finance, funds for financing, new mechanisms for resource allocation and the final use of financial resources.

This article shows qualitative and quantitative results from an evaluative research that integrate new financing indicators in order to identify the strengths, the weaknesses, the trends and the evidence on health financing after health care decentralization in Latin American countries.

Conceptual considerations

The model of analysis proposed in this study includes several financial aspects of health care decentralization. This model requires the examination of financial indicators to understand the changes in financing policies for health care reform (Herna´ndez et al., 1995; Khaleghian, 2003). The most commonly used conceptual framework for the dynamic financial aspects of health includes the definition of health expenditure as activities whose primary purpose is health improvement (WHO, 2000). This definition excludes large programs which impact on health, but whose primary goal is not health, for example general foods subsidies, housing improvement and large urban water supply projects. However, this definition does leave room for significant differences in the manner in which countries account for health-related programs such as targeted nutritional services and water quality improvement (Ramesh et al., 1997).

Recently, a new and more appropriate method for analysing the financial dynamics in health care was identified (Poulier, 2000). This method, called National Health Accounts (NHA), has had recent applications in developing countries. The NHA model incorporates different indicators of economic information related to the production and financing of health systems. This model allows the creation of a register of financial information to be used for understanding the trends in the principal indicators for spending, facilitating the analysis of the availability of resources in the health system and the payment capacity of users, and therefore aiding financial planning for the sector. The objectives of the analysis of health spending promoted by NHA are the following: (a) to identify the protagonists and economic entities that participate in the financing of the sector; (b) to identify the funds for the financing of the different social groups; (c) to identify the allocation of resources according to the type of provider and the health program; and (d) to identify trends and changes in different financing indicators (sources, funds, providers and allocation mechanisms), taking as a guide the reform strategies of the health sector, in this case the process of decentralization.

The NHA model is useful not only for knowing the spending levels associated with financing indicators, but also for identification of the qualitative and quantitative changes in these indicators, as well as knowing the expenditures made by households, health institutions and businesses. The core concept of National Health Accounts is the defining of the flow of funds. Experience in applying this concept in developing countries suggests that approaches used in developed countries such as the USA should be adapted to the specific needs of developing countries. The approach taken must take into account the more limited data available and be in accordance with the research questions. This requires modifying definitions both of the sources and uses of funds (Berman, 1996). One approach, used in Egypt, Mexico and Colombia, is to formulate the flow of funds in terms of three major levels: the original sources of financing, the financing funds and the health care providers (Frenk, 1994; Frenk et al., 1996).

In order to analyse the financial aspects for health care decentralization two more levels are added to this formulation: the final destination or financial resources utilized for different health programs and the mechanisms for financial resources allocation.

These new criteria are added to the analysis model for Latin American countries for two reasons: (1) to review the financial policies of these countries it is very important to identify both the origin and the final destination of the financial resources, and (2) in order to identify the direction of the financial resources in relation to the level of care, it is necessary to develop a set of indicators that become part of the resource allocation and in the final use of the resources in the different health programs.

Independent of the patterns of decentralization, there are five indicators that permit the identification of the flows and dynamics of financing for the three countries studied: the financing sources, the financing funds, the health service provider institutions, the mechanisms for financing allocation, and the final destination of resources. These indicators must be defined in order to analyse and understand the financial aspects of health care decentralization.

The sources of financing. The primary economic sources that provide the resources to the population for different activities. There are four sources of financing, classified according to the origin of the funds. These sources can be further classified either as internal or external. In the case of the health system, the internal sources are the government, industry and households. The external ones refer to the exchange that takes place within the health sector, through multilateral or bilateral agencies (Mills, 1991; Hsiao, 1994).

The financing funds. Reservoirs of economic resources, whose role is to administrate resources and buy medical services. These funds can be real or virtual, animportant distinction since virtual funds can be used only in a limited way and they are in constant competition with the acquisition of other necessities (Abel-Smith, 1967). In addition, they depend on the preferences of individuals and can be drastically reduced by a period of lower income, an economic crisis or an adjustment in policy.

The health service provider institutions. Government and non-government organizations providing health care services to the population. According to the sources of finance and consumers, there are three classifications of provider institutions: social security, public assistance and the private sector (Bossert et al., 2003; Jamison and Mosley, 1991).

Mechanisms for financing allocation. The mechanisms for financial resource allocation for health expenditure include legal, political and technical principles. These mechanisms provide the means for financial resource allocation in the production of health care services, and the financing adjustments necessary for health care decentralization (Bobadilla and Lozano, 1990, 1998; Arredondo and Parada, 2003).

Final destination of resources. The classification of health expenditure by health service providers, according to its final destination and depending on the financing fund. The decentralization process requires health policy makers at a local level to make improvements on, and design new methods for, the management of the final use of resources. In doing so they must take into account local health priorities and act according to two major variables: system variables (supporting programs, current expense factors and investment, health services to be provided), and population variables (which include the type of services demanded at a local level: primary care, secondary care and third level care) (Musgrove et al., 2002; Collins and Green, 1993).

A thorough analysis of the five financial indicators presented above allows us to identify substantial changes that have taken place in the area of financing policy in each country, and thereby assess the feasibility of decentralization. Quantitative and qualitative analysis of these indicators makes it possible to identify strengths and weaknesses related to each indicator.

For example, the indicator related to financing sources permits us to identify if the municipal or state governments of a country have increased or decreased the level of health spending. The financing sources indicator also shows the changes in the relative weights of each source of financingnt ernal and external donations, contributions from the state to the federal level, households, and businessesef ore and after decentralization has taken place in each country.

This conceptual framework allows the identification of countries whose state or municipal governments have increased their levels of health spending, or where changes have occurred in the contributions from businesses and households. In addition, it allows detection of which countries implemented new mechanisms for resource allocation and which countries continued with the same mechanisms that were in use prior to decentralization. It is therefore important to identify and define the different analysis categories used for the financing sources:

- Households=monetary contributions directly from family incomes
- Enterprises=monetary contributions directly from employers
- Federal Government=monetary contributions from federal taxes
- State Government=monetary contributions from local taxes
- Government-Taxes=monetary contributions from federal and local taxes
- Government-Credits=monetary contributions from credits with international banks via the federal government
- Government-Donations=monetary contributions from donations made by international agencies via federal or local government
- Donations=monetary contributions directly from donations of international and national NGOs

Methodology

This study used an evaluative longitudinal design that combines quantitative and qualitative data in three Latin American countries selected according to various criteria: Different economic development (per capita income): high-middle income, low-middle income and low income; A country must have experienced a significant period of financial adjustment for health care decentralization; Policy makers must be interested in, and receptive to, output from the study to ensure that the research results will be used; There must already exist a database in the country to analyse the financial aspects of health care decentralization; Multi-disciplinary research capacity; Relative political stability; Reliability of the financial data on health. The information on these variables was taken from different bibliographic sources and direct interviews via Internet with officials in the selected countries. Information provided by the interviewees and data reviewed in the publications led to the selection of ten countries for the analysis: Bolivia, Brazil, Mexico, Argentina, Chile, Peru, Nicaragua, Costa Rica, Panama and Ecuador.

The identification of type of income was based on per-capita income indicators for the countries included in the World Development Report edited by the World Bank. Four countries with a high-middle income (per capita income greater than US$ 3000.00: Mexico, Brazil, Argentina and Chile), three countries with a low-middle income (per capita income between US$ 1500.00 and $ 3000.00: Peru, Panama and Costa Rica); and three with a low income (per capita income under US $1500.00: Nicaragua, Ecuador and Bolivia) were identified. Cultural similarity is given by the fact that only Latin American countries were included. In only five of the ten countries did the interviewed decision makers respond favorably with respect to their interest in the study and the possible utilization of the expected results. Only six of the ten countries (Mexico, Chile, Panama, Nicaragua, Ecuador and Peru) had trustworthy and methodologically comparable databases on funds and financing flows in health. All countries had the capacity to form interdisciplinary teams.

To select the three countries ultimately studied, more detailed information on the decentralization and financing policies in each country was taken into account; this information included the following variables: Background of health care decentralization; Pattern of decentralization; Financing policies; Changes in the financing policies; Background of national health accounts; Reliability of databases; and political support from policy makers. For this stage in the selection, only countries which had a background of studies and databases on funds and financing sources were included: Mexico, Chile, Panama, Nicaragua, Ecuador and Peru. Of these six countries, three were selected considering as basic technical requirements the following: a background of decentralization, changes in financing policies, a system of national accounts in health, and reliable information. The results of this stage gave the final selection of the three countries to be analysed: Mexico, Nicaragua and Peru.

Quantitative information was incorporated into a health spending matrix according to the financing sources, funds of financing, and providers for each of the selected countries. In this matrix the trends in health spending for the period 1991±2000 were identified. This quantitative information was elaborated according to the type of financing source, and identifying the trends in the financing levels for the different financing sources in each country. Finally, a cross-analysis was made of the qualitative and quantitative analyses to validate the information obtained.

In the bibliographic search, 117 references from published documents in three countries were identified. In addition, 26 unpublished documents were identified based on information given by key informants, providing an indication of the number of unpublished documents that exist. A total of 143 information sources were selected for data collection.

Qualitative information was gathered through key personnel in each country. Informants were selected for interview by referral of Health Ministries because of their knowledge and experience with the issues of the general study. A field-work coordinator was chosen for each country and the field-work strategy was standardized, along with the instruments to be used. Key personnel were selected according to their level of participation in the decision-making process in the development, implementation, and evaluation and/or monitoring of decentralization in each country included in the study.

A total of 90 interviews were carried out in the three countries by using as guidelines designed according to the health systems in the chosen Latin American countries. These guidelines included six categories of questions: (1) changes in the sources of financing, (2) changes in the financing funds, (3) changes in the level of financing according the type of provider, (4) changes in the mechanisms of financing, (5) changes in the final destination

of resources, and (6) strengths and weaknesses of each financing indicator before and after decentralization. In order to analyse the validity of the information obtained, an exercise in internal and external validity of the selected indicators was carried out, repeating the interview in 10% of the cases in each country.

The identification of weaknesses and strengths was based on interviews with key personnel in the selected countries. In order to analyse the collected information, interviews were processed in a database using the ATLAS-Ti software. This procedure followed a series of standardized procedures with precise steps: (a) capture and clean-up of interviews; (b) formatting of interview, a process that involves preparation of the material into the order required by the database; (c) codification, an essential process to thematically organize the database. Taking as the background the themes explored in the interview guidelines, the key variables were determined (financial sources, financial funds, providers, mechanisms of resource allocation and final destination) to follow a thematic order of the information. Then, the software ATLAS-TI selected the key indicators to identify the weaknesses and strengths; (d) creation of a technical report, a process mostly based on the analysis of the interviews. Analysis of informants' responses made it possible to examine their level of knowledge about the strengths and weaknesses of federal and local financing initiatives related to decentralization. Qualitative information was integrated into five compartments that describe the main characteristics of the changes in financing policy related to decentralization, changes in financing sources, changes in funds, changes in the mechanisms for allocating resources, and changes in the final destination of resources.

The qualitative and quantitative data were put together in the analysis to strengthen reciprocally both types of information. The quantitative information was validated and adjusted by the results of the qualitative information. For example, the trends observed in the health financing described in the quantitative results were referred and validated by the key informants in the qualitative analysis. Thereby, allowing this exercise to document the changes in health policy, and its effects in the financing.

To analyse changes in financing indicators before and after decentralization, 1994 was chosen in our analysis to be the dividing line for decentralization. This decision was based on the following criteria: (a) In all three countries, the decentralization process began before 1994; (b) In all three countries, decentralization is an ongoing process and may be considered as an implementation strategy to be consolidated during the coming years; (c) Information sources on financing matters are not considered valid before 1990, which was the base period for the implementation and validation of methods for the integration of national health account systems for the three countries in the study; (d) In 1994, important changes took place in each country that served to continue and emphasize the decentralization process. Based on these criteria, and on the availability, accessibility, validity and reliability of the information on financing indicators, the period of analysis was defined as 1991± 2000. In order to compare the results from different countries, the national currency of each country was converted to US dollars.

Results

Documentary information suggests the argument that juridical and legal aspects govern the implementation of changes in health financing-decentralization in each country, aside from the technical-administrative criteria and the new organizational structures that make the decentralization process feasible and concrete. In the three countries, the juridical-legal framework for decentralization was formed by making new laws and ministerial resolutions in health, which were approved by the appropriate legislative bodies. This framework, which originated in 1983, sets forth legal guidelines for a gradual implementation of health services decentralization in the three countries. It takes into consideration both the production and financing of health services.

Notwithstanding that in Peru the first decentralization laws and programs of the health system were carried out in 1994, it is noteworthy that other new decentralization laws were still being proposed and approved in 1998 in order to reorganize the progress achieved and set forth new mechanisms of financial allocation. In the three studied countries, new administrative organizations have been created in order to fulfil the decentralization process. These organizations have resulted from new plans for the organizational structure of health. In Mexico they are represented by the COPLADES and SILOS, in Nicaragua by the SILAIS and the COLOS, and in Peru by the ZONADIS, CLAS and the CTAR. These organizations constitute elementary units in technical-administrative matters for the implementation, follow-up, monitoring and evaluation of decentralization.

Financing indicators and mechanisms for financial allocation for the period before decentralization were identified, in order to define a point in time from which

the implementation of changes in financing policies began. There are similarities in the observations for the three studied countries. Decisions about the production of services, as well as their financing, were being made completely at a central level, without leaving any margin for action at a local level. These decisions were taken independent of the needs of each state, department, region or county. Nevertheless, before the implementation of decentralization strategies, it is noteworthy that different financial resource allocation proposals were made to counteract the effects of centralized decisions. However, these proposals were taken into account only when decentralization became an explicit strategy aimed at achieving a greater equilibrium between the supply and demand for services.

Table 1 shows changes in financing indicators that were implemented or proposed in each country in order

Table 1. Major health financing changes proposed during health care descentralization

Variable / Country	Health financing changes proponed
Mexico	—Devolution of the health budget to the states —Reduction of the federal participation in health expenditures, limited to the national coordinated programs at the central level —Increase of the state government's participation in health expenditures —Financing negotiation mechanisms between the state and federal levels —Delegation in decision-making in financing —Separation of federal, state and municipal financing sources —New financing alternatives for providers at the local level —New fee for services mechanisms for the self-financing of local health Programs —Implementation of the health costs recovery system —Special subsidies for prioritary programs at the state and federal levels —New mechanisms for resource allocation according to historic trends but at a local level —Proposal for the integration of economic and epidemiological criteria —New control and supervision mechanisms for the use of financial resources
Nicaragua	—New budgetary decentralization system. Power of decision in financing Matters —Budget execution and financial planning according to local needs —Financial resource management at the SILAIS —New centers for financial responsibility and negotiation (national departmental) —Proposal for a cost recovery fee system at the local level —Development and implementation of a new methodological system for financial resource allocation and budget negotiation (departmental-country) —Integration of financial requirements based on local health indicators —Transfer of financial power on human resources (not goods and services) —Implementation of new national accounting and financial administration systems to facilitate the decentralization of goods and services
Peru	—Devolution of the health budget to the different regions, directly from the Ministry of Finances, without passing through the Ministry of Health —The MINSA transfers financing to the regions for national programs, allocating according to the health need from each subregion —A new budgetary structure for decentralization, based on different financing sources: homes, government and international donations —Creation of the office of financing, investments and external cooperation —New negotiating and financial resource allocation mechanisms, as a function of the projection of the epidemiological profile, by subregions and expenditure ítems —The local patterns establish fees as a function of referential prices, and as a basis for fixing financial on financing policies —The local patterns establish fees as a function of referential prices, and as a basis for fixing financial amounts with state charge, depending on the services to be produced. Implementation of a cost control system —creation of a transitory health administration boards to restate budgetary decentralization and new mechanisms for allocation, within the decentralization Framework —Program-proposal for financial centralization to restate decentralization financing policies

to make decentralization more feasible. In Mexico, there was a stronger devolution of decision-making and the management of financing policies than in the other two countries. Although Nicaragua and Peru implemented budgetary decentralization, the responsibility for resources, funds and financing flow remained at the central level. There are two financial strategies which stand out: first, the implementation of cost-recovery fee systems as new financing mechanisms and second, the implementation of new methods for financial resource allocation at the departmental, state and county levels.

Health financial information is referred in Table 2, which shows health expenditure trends, according to financing sources, for before and after decentralization (taking the 1994 dividing line). It is important to emphasize that financing sources represent the origin of financial amounts. The different categories of analysis used in the three countries were defined above in the conceptual considerations section. At first glance, it is interesting to see that as of 1994 all three countries experienced significant changes in all financing sources and in total expenditures. In actual fact, in Mexico there was an abrupt fall in total

Table 2. Trends of health expenditure by sources of financing before and after decentralization: 1991-2000. Mexico, Nicaragua and Peru (millions of US$)

Year / Source	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Mexico										
Households	7689	7802	9275	9768	5870	6156	6810	7321	7605	7803
Enterprises	4865	4890	5362	5639	3053	3015	3200	3886	3961	3968
Federal Government	3529	3339	3577	3918	2232	2638	3195	3685	4433	4709
State Government	26	47	228	577	586	753	963	1233	1434	1534
Total	**16109**	**16078**	**18442**	**19902**	**11741**	**12562**	**14158**	**16125**	**17433**	**18014**
Nicaragua										
Households	nd	nd	12	12	15	16	16	19	20	22
Enterprises	nd	nd	00	9	26	39	48	42	42	47
Government-Taxes	nd	nd	34	25	21	81	93	91	94	97
Government-Credits	nd	nd	31	24	20	20	24	12	16	13
Government-Donations	nd	nd	38	40	38	38	36	35	33	39
Donations NGOs	nd	nd	3	5	6	4	5	5	7	5
Total	**89**	**93**	**118**	**115**	**126**	**198**	**222**	**204**	**212**	**223**
Peru										
Households	1268	1247	822	890	690	942	975	996	1023	1055
Enterprises	818	855	487	583	797	849	891	904	931	1004
Government	801	720	437	456	585	1095	1253	1312	1107	1269
Donations	16	18	13	22	28	20	18	22	12	23
Total	**2903**	**2840**	**1759**	**1951**	**2100**	**2906**	**3147**	**3234**	**3073**	**3351**

financing, which tended to recover by 1997±2000 though not up to 1994 levels. This fall was accompanied by a significant decrease in the contribution of homes and businesses with respect to total expenditures. Federal as well as state government contributions showed a positive trend. This positive trend is noteworthy in the case of Mexico, since in this country state government contributions are an important financing source for decentralization. This trend is very important at present as one of the health reform strategies in Mexico is to rethink and consolidate decentralization in the states where it has been suspended or has not begun.

In Nicaragua, a slight fall in total expenditures occurred in 1994, which mostly recovered by 1995. An important issue for this country was the reactivation of social security, which accounted for a relatively important fraction of the total expenditure between 1994 and 1997. The contribution of donations remained almost unchanged, while the government contribution diminished after 1994 and recovered in 2000. Peru also experienced a positive trend in health expenditures over the study period. As of 1994, contributions from homes increased significantly with respect to other sources, although as a proportion of total expenditure they exhibited a negative trend. On the other hand, businesses exhibited increased contributions with respect to other sources and a positive trend as a fraction of total expenditures. Government sources in all three countries exhibited a positive trend when compared with other sources and with respect to total expenditures.

In the case of Mexico, while both state and federal governments showed positive trends in expenditure, this trend is much stronger for the state government. With regard to contributions to financing from external cooperation, only in the case of Peru and Nicaragua is there a record of this information due to its importance in these countries a source of health financing. External financing is particulary important in the case of Nicaragua where, despite a drop in donations in 1994, they remained around the same average (30%) over the period of study. Looking at Peru from 1994 onwards, it is seen that external donations increased 100%, from 1% of the total expenditure, to 2% after 1994.

Table 3 presents the global strengths and weaknesses that were analysed according to the interviews regarding the implementation of changes in health financing policies in each country after decentralization. In Mexico, the main strengths observed were the devolution of financing decisions and the sharing of responsibility for the generation of local financing sources between the state and municipal levels. The main weakness observed for Mexico was the absence of a culture of economic efficiency in the organizational dynamics of local health systems and in human resources. In Nicaragua, the main advantages were new financial allocation mechanisms and budgetary decentralization.

The main disadvantage observed for the three countries studied was their great financial dependency on central level decisions. This was the primary disadvantage in Peru, where financial decentralization consisted in directly allocating financial resources to the regions from the Ministry of Finances, maintaining a system of decision-making at the central level. One of the main advantages in financing changes was the implementation of new mechanisms for financing and financial control, with the private sector's participation.

Table 4 presents a summary of evidence focused in a more specific way on health financing indicators under study in the three countries. In this table the strengths and weaknesses discovered in the analysis of financing indicators from the period after decentralization are given (sources, funds, providers, final destiny of resources). It is evident in Table 3, that the strong points for each country were the changes in financing indicators. These changes range from the integration of economic information bases to the implementation of new financing mechanisms, along with the creation of new financing sources and new financial control mechanisms. The main weaknesses for each country, however, stem from a strong dependence on central level financing and, therefore, on the negative effect of macroeconomic variables on financing at state and municipal levels. These results are analysed in greater detail in the following section where trends in each of the financing indicators for the period 1991±2000 are identified.

Financing sources

The most important result on financing sources is undoubtedly the diversity of financing sources described by both financial information and the interviewed informers. In this case, there is as a primary source, federal financing, complemented by recovery fees and state and municipal contributions. These direct contributions are complemented by the support of the public welfare's patrimony, community contributions, donations and some international support, when this is available. But other authors reported the family out-of-pocket spending for health services as a negative effect of health system in many countries (Ranson, 2002; Merlis, 2003; KeXu, 2003). In our study

Table 3. Evidence of strengths and weakness of health financing policies after health care decentralization

Variable / Country	Strengths	Weaknesses
Mexico	—Financial devolution in all items —Funds and financing sources under shared responsibility, between national, state and municipal levels —New financing sources and alternatives at the state and country levels, with community participation —A relatively high contribution from homes for the financing of health programs —Negotiation of subsidies at local and central levels —State and country government responsibility in the allocation, use and control of financial resources —Consolidation of a health cost recovery system with differentiated charges according to the annual state, country and family per capita income	—Absence of a culture of economic efficiency to implement the financing changes —Few human resources at the state-country level with the required abilities for financial changes after decentralization —Low promotion and evaluation of new financing mechanisms at the local level —Confusion, at the country level, in decision-making for financial resource management —Absence of the private sector in budget allocation and administration boards —Absence of technical criteria for the allocation of financial resources according to new changes
Nicaragua	—Financing deconcentration in the human resources item, and some goods and basic services —Implementation of new methods and financial allocation mechanisms based on a per capita that is corrected with local health indicators, as well as demand and supply —Implementation of a national accounting system and financing control for decentralization —Implementation of a new budgetary decentralization system, with a new programmatic structure —Development of a proposal to put into practice pilot studies for new sources and financing funds at the departmental and country levels	—Decentralization of financial resources practically limited to contract human resources —No financial alternative has been consolidated in the production of local services —Scarce deconcentration of decision-making power on the use and allocation of financial resources; local levels depend on the central level —Absence of human resources to effectively implement the accounting and budgetary decentralization system in counties —Low contribution of homes to health expenditures —High financial dependency on external cooperation, on loans as well as donations
Peru	—Direct devolution of financing from MIFIN to the regions, without passing through MINSA. Local decision-making power —Identification of possible financing sources for the economic feasibility of decentralization —To implement new control and financial negotiation mechanisms, at the regional, departmental and municipality levels —Implementation of transitory boards for the control and follow-up of budgetary decentralization —Implementation of local financial administration boards, with participation from the private sector and local leaders proposed by the community —Creation and implementation of the office of health financing, to support the decentralization process —High participation of the contribution from homes as sources of financing for health	—Financial alternatives for decentralization were identifies but have not been implemented, there are only attempts —The financial decision-making power is still centralized —High risk that the CLAS and transitory boards will bureaucratize the budgetary decentralization —Confusion and backwardness with the new decentralization law. It sets forth the devolution of financial resources at the central level and restatement the new policies for health financing —Absence of a financial resource allocation mechanism which, under technical standardized criteria can be adecuate to each region —Conflict between the MINSA and MIFIN to restate the financing policies in the context of the new decentralization law. The conflict also appear between national, regional, state and municipal levels

Table 4. Evidence of strengths and weakness on source of finance, funds of financing, providers, final use of resources, and mechanisms for resources allocation after health care decentralization

Variable / Country	Strengths	Weaknesses
Mexico	—Identification of state and country governments financial contributions —High participation of homes in the expenditure —Growing per capita health expenditure trends, even with the economic devaluation crisis of 1994 —The health expenditure for public assistance institutions is lower, compared with the social security institutions —Growing trend in public expenditure (% GNP) —Positive trend of economic support for public assistance from the central government —High percentage of capital-investment expenditure —Positive trends of local government contributions to the financing of health programs —Equilibrium between social security and unisured	—Health expenditure indicators by attention level follow a national trend and not a local trend —There is no information system that can identify sources and state and country financing funds by type of institution —It is not possible to analyse trends of final destination of financial resources; standarized information does not exist —Contributions from households show a negative trend, which will affect the new financing alternatives —Per capita expenditures in health may present decreases due to a devaluation —There are no proposals for different changes in financing policies in phase IIdecentralization —Large fall in percapita expenditures in 1994
Nicaragua	—Financial information systems organized by region, departments and counties —Positive trend in the per capita health expenditure —Growing trend in the contribution from homes to the total health expenditure —Priority give to public assistance by government financial contributions —Identification of financing indicators for NGO's in health —Positive trend in health expenditures as a proportion of the GNP —Consolidation of financing for social security —Growing contribution from enterprises	—Low participation of households —Financing with high dependency on external cooperation, including NGOs —Financing indicators have not been integrated into the allocation mechanisms —The expenditures by attention level and item do not exist before decentralization —It is not possible to develop indicators on financing contributions by the local level —The per capital expenditure is quite low with respect to other countries of the region, no with respect to the GNP —There is no equilibrium between financing amounts of the different health funds
Peru	—Financial information is concentrated in the Ministry of finances and in the Departments —Financing equilibrium among providers —Low dependency on external financing —Permanence of contribution from households to health expenditure —Positive trend in per capita health expenditure —Equilibrium between running expenses and investment —Growing trend in expenditures public assistance with respect to social security and private sector	—Large fall in contributions from households since 1994 —Very irregular trend in health financing from enterprises and workers —Negative expenditure trends for social security and the private sector after 1994 —There is no information to quantify financial contributions at the regional or local levels —There is no equilibrium in the destination of expenditures for first, second and third health care levels —Mechanisms for allocation are not integrated into financing indicators

this is a relevant advantage because households' contributions reported represent a positive effect like a new source of finance, despite economic crises existing in the three countries under study.

According to financing trends analysis, the main disadvantages of the financing sources in the first place were the low financial participation of federal bodies, as well as particular limitations on access to federal funds and programs. This problem was documented as part of a context marked by budgetary cuts and by the limitation of financing sources. Correspondingly, limited access to public welfare funds and scarce support from donations was added by key informants, as well as low community participation and a limited local capacity for fundraising. As one of the worst effects in this area, informants pointed to the fact that at times, the personnel had to finance some needs of the health system.

Financing funds

With respect to financing funds, their characteristics and particular dynamics were examined. In the first case, we mainly looked into particular aspects of direct and complementary funds. Mechanisms are described for direct allocation of fixed funds, while additional fundraising mechanisms are analysed for complementary funds for the operation of services and programs. On the other hand, in the dynamics of funds, we describe their origin, administration and use, highlighting the influence of decentralization on these dynamics.

Analysis of financing funds allowed the identification of a set of administrative advantages, where we noticed a greater capacity for local fundraising. This capacity was accompanied by a greater access to states of account, autonomy in resource management and better training for financial resource management. Finally, the opening of participative spaces was noticeable, which allows, not only for an efficient management of funds, but also for the possibility of allotting resources from diverse sources for financing emergencies.

With respect to financing funds, some highlighted the lack of autonomy and administrative capacity for managing financing funds. They also mentioned the lack of criteria for the administration of additional financing sources, as well as the lack of knowledge on municipal contributions, when these exist. A pronounced dependency on external funds and programs was also underlined (external to federal bodies), as well as a discontinuous participation of community contributions.

Health providers

From a quantitative view, the results allow the identification of significant differences with regard to trends of the financial funds by provider type at different levels. A first level refers to the effects of analysing the provision of services to insured vs non-insured. A second level deals with the analysis of trends with respect to financial funds between public and private contributions, as well as donations. From qualitative view, the previous results were able to be validated and further explored, since according to the key informants there is a greater participation of monetary contributions by the users and employers, in addition to the need to identify more and better financial alternatives. On the other hand, with respect to the variable 'providers', the qualitative analysis was able to point out the limitations and difficulties of the increasing trends of financial funds encountered by type of provider in each country.

Financial allocation mechanisms

Resource allocation is one of the most complex processes of the analysis, where criteria are studied, as well as allocation behavior in the context of decentralization. In the case of criteria, we identified calendar, historical and programming elements that were relevant to this study's objectives, while the financial allocation behaviors were related to the actors' participation in the definition of sums and in ideas on how these sums were assigned. In the first case, we described diverse dynamics related to the lack of spaces allowing for a greater influence of the intermediate and operational levels in allocation criteria. The second case is characterized by consensus around the notion that assigned resources are insufficient to finance the planning and operation of current health services and programs in the states.

With respect to financial allocation mechanisms, a greater flexibility in resource allocation was observed, from which a set of favorable situations is derived as a result of decentralization; among these are periodic budgetary adjustments, a more efficient programming of expenditures and a simplification of administrative procedures to expedite allocation. It is important to point out that a large part of these benefits was set forth as a consequence of a greater political will to search for an increased local control of resources, supporting locally established priorities, as well as improving relationships with service providers through the development of participative dynamics that allow for better decision-making on expenditures.

Among the adverse effects identified with respect to financial allocation mechanisms, the following stand out: lack of knowledge on allocation criteria, as well as the identification of problems in expenditure allocations, above all in processes related to planning. In the administrative-financial sphere, an excessive control of expenditures was mentioned, as well as the lack of flexible operations schemes, together with non-fulfillment of payments, excessive paperwork and inequity. These are all problems leading to the notion that there have been few relevant changes in allocation mechanisms and criteria in the context of decentralization.

Destination of resources

The destination of resources represents the end of processes related to the financing of health services. This point was studied with respect to the scenarios allowed by decentralization for expenditures in the operation and planning of services and programs. In this context, several interpretations stand out where processes are described that are related to decentralization and tend to define flexible expenditure schemes, without yet achieving full operational autonomy.

The main strengths identified by informants on the destination of financing funds were linked to operational work, which is the raison d'etre of health services. In this particular case, we specifically talked about the fact that the final use of resources is subject to a process to define needs priorities and the optimal use of resources. As part of the final use of resources, a greater provision of materials and medicines was mentioned, as well as the development of infrastructure. According to informants' testimonials, this effort is directed towards the search for greater accessibility to services for economically vulnerable populations. In a considerable number of cases, it was reported that the orientation of social expenditure can be based on principles of equity, or searching for a greater fulfillment of health needs. In this case, a sample of these dynamics was the investment of additional resources to achieve better operational goals, through the financing of brigades to strengthen particular programs.

Talking about weaknesses related to the final destination of resources, limitations were pointed out in expenditure planning, directly affecting operative expenditure. This problem becomes more complex in contexts with regional diversity, since it is accompanied by problems of accessibility to services, as well as operational problems such as the lack of timely supply and supervision limitations. Problems were also identified in operative work affecting health system financing, such as a lack of equity in allocation, unclear limits in operative functions and a permanent increase in goals with limited operative personnel. All this, together with the lack of resources, leads to a situation where the personnel is operating in a conflictive arena, under pressure to fulfil operative goals.

Changes on decentralization and financing

At the administrative level, it is worth noting that there is a referred lack of flexibility in the local management of resources and normative rigidity. In this case, we identified the need to adapt decrees with a national scope to local realities; as a consequence, this situation has led to vertical controls, the lack of access to written norms and the coexistence of different operational schemes. At the administrative level, an increase in paperwork was also emphasized, as well as the lack of knowledge about the functional structure of local health systems.

With respect to the main weaknesses of changes in financing policies stemming from decentralization, financial and qualitative information suggests the need to strengthen the state-municipality relationship. In this context, decentralization has been accompanied by new processes oriented to the centralization of human, financial and material resources within the federal bodies, as well as corporative processes as a harmful effect of some governmental programs providing support to the poor. In addition, key informants suggested that the legal framework is not very developed, as well as the fact that different stages of decentralization are out of sync within the countries.

Discussion and conclusions

The objective of this study was not to judge decentralization as a success or a failure, but rather to identify its effects on health financing and through this to identify empirical trends, weaknesses and strengths for health planning and financing. Therefore, the discussion and conclusions presented below are directed toward findings on the financing indicators which were used, the application of the proposed analytical model, as well as suggestions made in light of the financial strengths and weaknesses observed in each country. The different components investigated in this study may be used to analyse financial changes in the health sectors in other Latin American countries at different stages of decentralization.

Retrospective data gathered with key informants show that where decentralization has been in place for some time, modifications can be expected in the manner in which health financing changes are applied. For countries with mature decentralization, all five financial indicators of the framework can be used. For countries that have only just formulated their policies and the means for their implementation, or in which implementation has only recently begun, it is arguably not appropriate to look for change beyond organizational structures and processes. In these situations, the analysis should refer only to the way in which the components of the framework can contribute to the design of instruments and methodology for the assessment and analysis a posteriori. In other words, all components may be used in a consideration of the financial variables to be monitored in an analysis of the effects of decentralization on financial aspects.

The proposed model of analysis integrating qualitative and quantitative data based on five indicators was designed for rapid rather than exhaustive analysis and assessment. It is intended particularly for the study of the effects of decentralization on health financing policies, using financial indicators. Primarily it is a tool for retrospective analysis and must therefore rely on currently available information. The key components have been chosen with this criterion in mind. In this sense, the model of analysis stressed the changes in the five main financial indicators in the understanding of the macroeconomic dynamics of health systems in the context of decentralization and health care reform. Included were the expected changes in the following relationships: the source of finance and decentralization, funds of financing and decentralization, providers and decentralization, new mechanisms for resource allocation and decentralization, and the final use of financial resources and decentralization.

The integration and reciprocal re-enforcement of qualitative and quantitative results made it possible to gather evidence from both types of analysis to validate this information in order to fill the gap in the understanding of trends, to explain the changes, and to identify in the final analysis the strengths and weaknesses of the health financing after decentralization. As evidence we have the trends in the changes of financial funds (increasing contribution, but limited to households, increase in donations, and more or less government financing, etc), as quantitative results, that were validated by the qualitative results (more users participation in the health financing, increase health programs expenditures in infrastructure at the local level, etc). On the other hand, where the quantitative analysis only showed fluctuatingevidence in the financial funds in different years of the study, only the qualitative analysis provided an explanation to the understanding of such fluctuations.

With respect to the main strengths of changes in financing policies stemming from decentralization, there was a political, financial and administrative strengthening of the federal bodies. As a consequence of this process, the was a strengthening of new administrative organizations such as the political and financial entities where the budget is concentrated, as well as of the health services' operational work. As a result of strengthening the states, there was greater access to written norms, as well as to strategic information for decision-making in matters of financing. The combination of both processes has been accompanied by substantial administrative improvements for the operation of services and the management of resources at the state and jurisdictional levels. The observed administrative efficiency has produced empowerment of authorities at local levels, as well as a greater autonomy with respect to resource management, as a consequence of the responsible practice of opening spaces to participation in decision-making on financing policies.

Health services financing reflected patterns where one observes, on the one hand, direct financing which is mostly insufficient and compensated for by indirect financing dynamics according to each state's fundraising capacity. These dynamics appear in a context of continuous federal budget cuts, whose solutions with alternative sources are strongly related to the decentralization experience in each state and where states with a greater decentralization experience develop more complex indirect financing schemes.

An extremely relevant aspect of the study is that it definitely shows more advantages than disadvantages with respect to the influence of the decentralization of health services on financing policies in the studied countries. Aspects where the greatest progress was observed are: (a) The increase of financing sources that are different from federal government contributions; (b) The introduction of new and more efficient financial allocation criteria that allow for a better adjustment of municipal and state health services to local health needs; (c) The introduction of a culture of decreased federal dependence in matters of financing and greater responsibility with respect to financing policies at the state and municipal levels; and (d) The promotion and development of technical abilities for human resources at the state and municipal levels, in matters of financing sources and funds, resource allocation and new financing alternatives.

It is necessary to stress that the main strengths and weaknesses as well as trendson healthfinancing identified in the three countries under study constitute evidencethat health policy makers at federal, state and municipal levels could consider inorder to design±redesign, implement, evaluate, and adjust health financing policiesin the countries included in this study, but also in any Latin American or developing country.

To make more specific suggestions for health planning and financing, for any Latin American country, one must first ask what the degree of decentralization is and later determine the financial decentralization pattern. In no country will one find a pure financial decentralization pattern, but it is possible to define a pattern. This study has observed three financial decentralization patterns in Latin America. For example, in Mexico there is a financial devolution pattern, in Nicaragua a pattern of financial deconcentration and in Peru a pattern of financial delegation.

Having defined the financial decentralization pattern independently of the kind of pattern involved, in order to identify trends and evidence on health financing, the next question to answer is whether there exists a system of national health accounts. If no such system exists, the decision will be to implement a system of national health accounts in order to incorporate financial indicators into the decentralization process. If it does exist, then it will be necessary to determine if the financial indicators are separated by financing sources, financing funds, financing amounts by provider type, financing amounts according to final destination (at least by attention level and expense item) and finally, explicit mechanisms for financial allocation with respective amounts according to technical criteria.

If financing indicators are not separated, the decision will be to apply the conceptual and methodological framework used in this study, in order to organize the financial information according to pertinent indicators and evaluate and monitor the decentralization process from the perspective of feasibility and financial sustainability. If the financing indicators are separated according to the five required indicators, the approach will be: the definition of financing mechanisms; identification of indicators according to their financing alternatives; definition of indicators at federal, regional and local levels; identification of new financing mechanisms and financial allocation; and finally, a comparative analysis of all indicators developed at regional and local levels.

Finally, the different information levels must be integrated in order to make informed decisions as to adjustment, changes or new planning elements needed to carry out the implementation, monitoring and evaluation of financial changes within the context of decentralization. The identification of the five financing indicators will contribute to determining the financial feasibility of decentralization and, later on, its financial sustainability, in the context of the characteristics of a particular country.

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Análisis del gasto en salud reproductiva en México, 2003*

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Los procesos de descentralización de los servicios de salud en México otorgaron a los estados independencia para asignar sus recursos de acuerdo con las prioridades nacionales y locales de salud. Esto generó la necesidad de contar con la información financiera que permitiera conocer el monto de los recursos asignados a las áreas prioritarias de salud. Para satisfacer esa necesidad se creó el Sistema de Cuentas en Salud a Nivel Federal y Estatal (SICUENTAS),[1,2] que brinda información mediante una estructura que estandariza los gastos según las funciones generales del sistema de salud. Sin embargo, a pesar de lo detallado de esa información, su desglose no es suficiente para identificar el gasto realizado en actividades específicas y poder evaluar el desempeño del sistema de salud.

La falta de información específica en salud reproductiva imposibilita monitorear el impacto del proceso de descentralización en la asignación de recursos a actividades consideradas prioritarias en esta área. Además, no permite conocer si la distribución actual del gasto se adecua a la distribución geográfica de las necesidades de salud. Esta carencia de información cobra especial importancia si se tiene en cuenta que en 2003, 1 313 mujeres fallecieron por trastornos obstétricos — como hipertensión durante el embarazo (31%) y hemorragias durante el embarazo y el parto (26%) — evitables con intervenciones poco costosas.[3] La mayoría de estos fallecimientos ocurrieron en los estados más pobres de México. Debido a esta desigualdad, una mujer de un estado considerado pobre, como Guerrero, presentó ocho veces más probabilidades de morir por trastornos obstétricos que una mujer de un estado considerado rico, como Nuevo León.[3] En relación con la salud perinatal, la Secretaría de Salud señaló que en el año 2003, dos de cada tres muertes infantiles ocurrieron antes de alcanzar la primera semana de vida y 20% del total fallecieron durante las primeras 24 horas después del nacimiento. Más de 70% de las muertes infantiles estuvieron asociadas con afecciones perinatales o malformaciones congénitas.[4]

Los tipos de cáncer que más muertes provocan en mujeres mexicanas son el cervicouterino y el de mama. Similar a lo que sucede con la mortalidad materna, la prevalencia de cáncer cervicouterino ha sido mayor en las zonas rurales y en los estados más pobres, mientras que el cáncer de mama es más frecuente en los estados con mayor desarrollo.[5]

En 2003, el sistema de salud mexicano estaba integrado por el sector privado que abarcaba los servicios de salud provistos por instituciones particulares, las asegura-

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doras privadas y las organizaciones no gubernamentales que ofrecen atención a la salud y el sector público, compuesto por la seguridad social y los servicios del gobierno orientados a la población de escasos recursos. De las cinco instituciones que integraban la seguridad social, las de mayor cobertura eran el Instituto Mexicano del Seguro Social (IMSS), que cubría más de 40% de la población[6, 7] y el Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado (ISSSTE), que atendía a los empleados del sector público (10% de la población mexicana).[7, 8] Como parte del proceso de reforma del sector salud mexicano, ese año se introdujo en fase piloto el Seguro Popular de Salud, un seguro social voluntario destinado a la población sin acceso a otras formas de seguridad social.

Las principales instituciones del gobierno destinadas a atender a las personas de escasos recursos sin acceso a la seguridad social eran la Secretaría de Salud y los Servicios Estatales de Salud, así como el programa Oportunidades del IMSS (IMSS-Oportunidades). Se calcula que 24% de la población recurrió a este tipo de instituciones.[7] Los servicios del sector privado que se caracterizan por una baja regulación y una gran heterogeneidad en cuanto a la calidad y al costo atendieron a poco más de 30% de la población, según las estadísticas oficiales.[7] Un grupo muy reducido y privilegiado alrededor de 2% de la población total estaba asegurado por alguna compañía privada de seguros.

Como se observa, el financiamiento del sistema de salud mexicano es una mezcla público-privada y se caracteriza por una fuerte presencia del gasto privado. A pesar del incremento experimentado por el gasto público en los últimos años, el gasto privado continúa siendo el principal agente de financiamiento y en 2003, cerca de 90% de ese gasto provino de los pagos directos de los hogares.[9] En el caso del gasto público, la seguridad social desembolsó dos tercios de ese gasto, proporción que fluctuó desde 35% (en el estado de Chiapas) hasta 87% (en Nuevo León).[10] Según SICUENTAS, cerca de 90% del gasto en salud de ese año se dedicó a la atención directa, alrededor de 3% se destinó a servicios de prevención y a acciones de salud pública y el resto a actividades de rectoría, administración y formación de recursos, entre otras. Menos de la mitad del gasto en salud se realizó en los hospitales.[9] En conjunto, en 2003 se gastó alrededor de 6,0% del producto interno bruto (PIB) anual de México en actividades destinadas a la salud.[10, 11]

Los objetivos de este estudio fueron estimar el gasto en salud reproductiva en México durante el año 2003, analizar su distribución según los principales programas, agentes de financiamiento y proveedores de bienes y servicios de salud, y evaluar la relación entre el gasto en salud reproductiva y algunos indicadores económicos de los estados, mediante la metodología de cuentas en salud.

Materiales y métodos

Se estimó el gasto en salud reproductiva, tanto a nivel nacional como estatal, entre enero y diciembre de 2003. El gasto en salud reproductiva se desglosó en los cuatro programas de salud reproductiva de mayor cobertura y más recursos en México (salud materno-perinatal, planificación familiar, cáncer cervicouterino y cáncer de mama) y según los agentes de financiamiento (públicos y privados), los proveedores de bienes y servicios y las funciones de salud. Para ello se utilizaron los datos del estudio sobre cuentas en salud reproductiva, realizado por el Instituto Nacional de Salud Pública de México en 2004,[12] con financiamiento de la Secretaría de Salud a través del Centro Nacional de Equidad de Género y Salud Reproductiva. La estimación se realizó mediante la metodología de cuentas en salud, propuesta por el Banco Mundial, la Organización Mundial de la Salud (OMS) y la Agencia de Estados Unidos para el Desarrollo Internacional (USAID),[13] ajustada para las particularidades de México.[14] Esta metodología permite documentar el flujo de fondos para la producción y el consumo de bienes y servicios a través del sistema de salud, mediante tablas de doble entrada (matrices).

Definiciones operativas

Según la definición de la OMS, utilizada por el Centro Nacional de Equidad de Género y Salud Reproductiva, la salud sexual y reproductiva comprende las estrategias dirigidas a contribuir a que las personas tengan una vida sexual, reproductiva y posreproductiva satisfactoria, saludable y sin riesgos, con respeto a sus derechos y a su libre decisión.[15, 16] No obstante, en este trabajo la definición de salud reproductiva se restringió al conjunto de actividades relacionadas con cuatro programas específicos: a) salud materno-perinatal, que comprende la atención del embarazo, el parto y el puerperio, el aborto y la atención del recién nacido y sus complicaciones; b) planificación familiar, que comprende la provisión y el seguimiento de métodos anticonceptivos definitivos y temporales y la fertilización asistida; c) cáncer cervicouterino, que comprende la detección oportuna de este tipo de cáncer, las campañas de tamizaje y la atención de pacientes con cáncer o displasias; y d) cáncer de mama, que comprende la exploración mamaria, las campañas de tamizaje y la atención de pacientes

con cáncer de mama o displasias. La definición de trabajo abarcó, además, las actividades de promoción de la salud, capacitación de personal, rectoría y administración y formación bruta de capital, así como las investigaciones relacionadas con la salud reproductiva.[12] No se tomaron en cuenta las acciones dirigidas a los adolescentes, la atención de la menopausia y el climaterio y la atención del cáncer de próstata, como tampoco las dirigidas a la prevención y atención de las infecciones de transmisión sexual, ya que están comprendidas en las cuentas nacionales dedicadas a la infección por el virus de la inmunodeficiencia humana y el sida.[17] Para una mayor homogeneidad, en el caso de la atención hospitalaria se utiutilizó la 10.a edición de la Clasificación Internacional de Enfermedades.*,[18]

El gasto en salud reproductiva se definió como el monto de los recursos utilizados en las actividades comprendidas bajo la definición de trabajo de salud reproductiva. Su estimación se realizó a nivel estatal y solo se tomaron en cuenta las transacciones realizadas dentro del país entre enero y diciembre de 2003.[13] Se utilizó la información suministrada por la Secretaría de Salud, los Servicios Estatales de Salud, el IMSS, el ISSSTE y el programa IMSS-Oportunidades, así como la información sobre los pagos directos realizados por los hogares para la compra de servicios de salud reproductiva, los montos ejercidos por las aseguradoras privadas y por las dos organizaciones no gubernamentales (ONG) más grandes que trabajan en salud reproductiva: la Fundación Mexicana para la Planificación Familiar (MEXFAM) y la Federación Mexicana de Asociaciones Privadas de Planificación Familiar (FEMAP).

Para el cálculo del gasto se utilizaron las siguientes categorías de análisis:[12±14]

Agentes de financiamiento: entidades que acumulan fondos y los asignan para adquirir bienes y servicios entre los proveedores del sector salud. Se consideraron cinco tipos de agentes: gobierno (Secretaría de Salud federal, Servicios Estatales de Salud e IMSSOportunidades), seguridad social (IMSS e ISSSTE), pagos directos de los hogares, empresas privadas de seguros y ONG. Estas categorías se agruparon en sector público (gobierno y seguridad social) y sector privado (pagos directos de los hogares, empresas privadas de seguros y ONG).

Proveedores: instituciones que reciben dinero para ofrecer bienes y servicios de salud. Se agruparon en: hospitales, proveedores de atención ambulatoria (tanto los consultorios médicos como de otros profesionales de la salud, laboratorios y servicios de medicina tradicional y alternativa), farmacias, programas de salud pública (suministro, rectoría y administración) y servicios de administración general de salud.

Funciones de salud: actividades desempeñadas por instituciones o personas con el objetivo de mejorar el estado de salud de la población. Según el esquema utilizado por SICUENTAS en México,[14] el gasto se agrupó en:

1. Servicios de atención curativa, ambulatoria y hospitalaria.
2. Bienes proporcionados a pacientes ambulatorias, tales como los medios anticonceptivos y los suplementos vitamínicos durante el embarazo.
3. Servicios de prevención y de salud pública, entre ellos las consultas prenatales, de puerperio, de recién nacido y de planificación familiar, así como las campañas de promoción sobre salud reproductiva.
4. Rectoría y administración de la salud y los seguros médicos.
5. Formación de capital y de personal sanitario, de investigación y de desarrollo.

La categoría fuentes de financiamiento no se investigó por la dificultad de realizar el seguimiento de los fondos financieros hasta esa dimensión.

Estimación del gasto

Se siguieron dos estrategias para la estimación:

a. Mediante el ejercicio presupuestal, que consistió en la ponderación del gasto realizado con indicadores de los servicios otorgados. Este método se empleó para estimar el gasto de la seguridad social y de la Secretaría de Salud según la fórmula:

$$G_{ij} = P_{ij} * (Ssr_{ij} / Ss_{ij})$$

donde,
G_{ij} es el gasto en salud reproductiva en la institución $_i$ en el estado $_j$;
P_{ij} es el presupuesto ejercido para la atención ambulatoria u hospitalaria en la institución i en el estado j;
Ssr_{ij} es el indicador de los servicios de salud reproductiva prestados (por ejemplo, las consultas o los días de

* Los diagnósticos por programa se agruparon del siguiente modo: salud materno-perinatal: O99- O92, P00-P96 y Z39; planificación familiar: N46.X, N97-N98, Z30-Z31; cáncer cervicouterino: C65, D06 y N87; y cáncer de mama: C50 y D05.

estancia hospitalaria por diagnóstico) en la institución $_i$ en el estado $_j$; y Ss_{ij} es el total de los servicios prestados (por ejemplo, el total de consultas o el total de días de estancia hospitalaria) en la institución i en el estado j.

b. Mediante los costos, calculado como el producto de los servicios otorgados por el costo promedio de cada actividad, según los datos publicados[19±23] y los documentos internos de la Secretaría de Salud. Esta metodología se utilizó para estimar el gasto del programa IMSS-Oportunidades y de las ONG.

$$G = \sum Ssr * C$$

donde,
G es el gasto en salud reproductiva; Ssr son los servicios de salud reproductiva prestados; y
C es el costo de los servicios de salud reproductiva.

Se solicitaron las bases de egresos hospitalarios y de consulta externa a cada una de las instituciones participantes en el estudio. Para utilizar las mismas categorías presupuestales entre instituciones y evitar la duplicidad, en la información de los presupuestos utilizados se especificaron los rubros contenidos en cada categoría de gasto.

Para estimar el gasto del sector privado se utilizaron los datos de las encuestas de hogares. El gasto monetario y no monetario empleado por los hogares para la atención del embarazo y del parto, así como para comprar métodos anticonceptivos, se tomó de la Encuesta Nacional de Ingreso y Gasto de los Hogares 2002 (ENIGH 2002).[24],* Asimismo, se utilizaron los datos del uso de los servicios dedicados al diagnóstico y el tratamiento de cáncer cervicouterino y de mama contenidos en la Encuesta Nacional de Salud Reproductiva de 2003 (ENSAR 2003).[26] También se recabó información sobre el gasto de las ONG MEXFAM y FEMAP, así como de la Asociación Mexicana de Instituciones de Seguros, que cubre la población con seguro médico privado. Esta información se obtuvo de SICUENTAS.[9]

Análisis de los datos

Los datos nacionales se ordenaron en dos matrices de gastos. La primera contenía el gasto en salud reproductiva según el agente de financiamiento y la función de salud, mientras que en la segunda se ingresó la información del gasto estimado en salud reproductiva según el proveedor y la función de salud.[13]

Solo se pudo desagregar la información del gasto público hasta el nivel estatal. Con el fin de hacer comparaciones válidas entre estados, se dividió el gasto estatal de cada programa entre su respectiva población beneficiaria. Con la sumatoria de estas razones se conformó el gasto público en salud reproductiva por beneficiaria en cada estado. Los grupos beneficiarios se definieron a partir de normas oficiales y programas de acción. El gasto público en salud reproductiva por beneficiaria a nivel estatal se calculó mediante la siguiente fórmula:

$$Gb_j = (G_{SMP_j} / B_{SMP_j}) + (G_{PF_j} / B_{PF_j}) + (G_{CACU_j} / B_{CACU_j}) + (G_{CAMA_j} / B_{CAMA_j})$$

donde,

Gb_j es el gasto público en salud reproductiva por beneficiaria en el estado $_j$;

G_{SMP_j} es el gasto público en salud materno- perinatal en el estado $_j$;

G_{PF_j} es el gasto público en planificación familiar en el estado $_j$;

G_{CACU_j} es el gasto público en cáncer cervicouterino en el estado $_j$;

G_{CAMA_j} es el gasto público en cáncer de mama en el estado $_j$;

B_{SMP_j} es la población beneficiaria del gasto en salud materno-perinatal: mujeres susceptibles de quedar embarazadas‡ en el estado $_j$;[27]

B_{PF_j} es la población beneficiaria del gasto en planificación familiar: mujeres entre 15 y 49 años en el estado $_j$;[28] y

B_{CACU_j} y B_{CAMA_j} son las poblaciones beneficiarias del gasto en cáncer cervicouterino y de mama (mujeres mayores de 25 años), respectivamente, en el estado $_j$.[29, 30]

Se evaluó la asociación entre el gasto público en salud reproductiva por beneficiaria a nivel estatal y el gasto público per cápita en salud,[10], y el gasto público en salud reproductiva por beneficiaria y el PIB per cápita del estado[11] mediante medidas de tendencia central y el índice de correlación de Spearman (*r*).

* En la ENIGH 2002 se informa el gasto en anticonceptivos sumado al de vitaminas y otros productos. Por ello, para identificar el gasto exclusivo en anticonceptivos se utilizaron los datos de la ENIGH 2004 (25), en la que ambos rubros se presentan por separado.

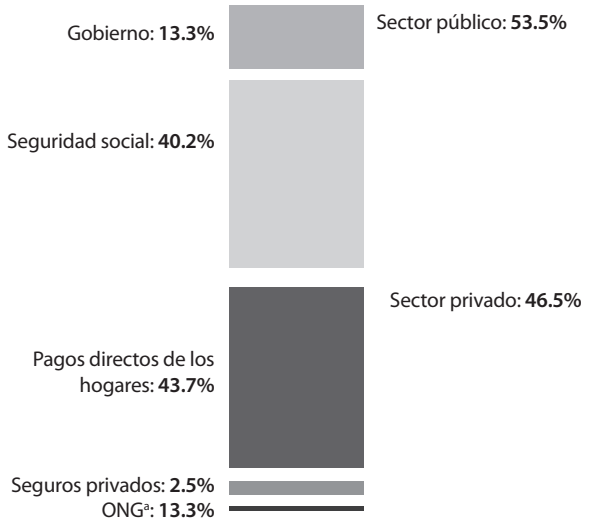
‡ Mujeres susceptibles de quedar embarazadas = (Población total * tasa cruda de natalidad)/1 000.

Toda la información se expresa en dólares estadounidenses según el promedio de las tasas de cambio publicadas por el Banco de México durante el período de estudio.[31] La información de las bases de datos se procesó mediante Stata Intercooled, versión 8.2[32] y las matrices de gasto se elaboraron en Microsoft® Excel 2002.[33]

Resultados

El gasto en salud reproductiva en México en 2003 fue de 2 912,6 millones de dólares estadounidenses. La distribución del gasto entre los agentes de financiamiento se presenta en la figura 1. Si bien 53,5% del gasto en salud reproductiva fue público, una parte importante (43,7%) provino directamente de los hogares.

Como se observa en el cuadro 1, el programa de salud materno-perinatal presentó el mayor gasto (85,0% del gasto en salud reproductiva), fundamentalmente por los pagos directos de los hogares. Las funciones de salud materno-perinatal, donde se concentró la mayor parte del gasto, estuvieron relacionadas principalmente con los servicios de asistencia curativa como los partos y las cesáreas y la



[a] ONG: Organizaciones no gubernamentales

Figura 1. Distribución del gasto en salud reproductiva entre agentes de financiamiento, 2003.

Cuadro 1. Gasto estimado en salud reproductiva según los agentes de financiamiento, por programa. México, 2003[a]

Programa	Total [b]	Sector Público		Sector Privado	
		Gobierno [c]	Seguridad Social [c]	Pagos directos de los hogares [c]	Empresas Privadas de Seguro y ONG [c,d]
1.-Salud materno-perinatal	2 475,7 (85,0)	252,8(10,2)	971,2(39,3)	1 189,1(48,0)	62,6(2,5)
2.-Planificación familiar	171,3 (5,9)	81,9(47,8)	53,5(31,2)	31,6(18,5)	4,3(2,5)
3.-Cáncer Cervicouterino	165,1 (5.7)	26,5(16,1)	86,3(52,3)	50,4(30,5)	1,9(1,1)
4.-Cáncer de mamá	63,3 (2.2)	10,4(16,3)	40,1(63,0)	0,6(0,9)	12,6(19,8)
5.-Rectoría y administración de la salud y los seguros médicos	26,6 (0,9)	6,3(23,8)	20,2(76,2)	NI e	NI
6.-Formación de capital, formación de personal sanitario e investigación y desarrollo	10,3 (0,3)	10,3(100)	NI	NI	NI
Total	2 912,6	388,2(13,3)	1 171,3(40,2)	1 271,7(43,7)	81,4(2,8)

[a] En millones de dólares estadounidenses. Tipo de cambio: 1 dólar estadounidenses =10,78 pesos mexicanos.
[b] Entre paréntesis se ofrecen los porcentajes con respecto al gasto total en salud reproductiva.
[c] Entre paréntesis se ofrecen los porcentajes con respecto al gasto total en el programa
[d] ONG: organización no gubernamental
[e] NI: Información desconocida

Cuadro 2. Gasto estimado en salud reproductiva según los cuatro principales programas de salud reproductiva y los agentes de financiamiento, desglosado por función de salud. México, 2003[a]

Programa	Total	Sector Público		Sector Privado	
		Gobierno	Seguridad social	Pagos directos de los hogares	Empresas privadas de seguros y ONG
1.-Salud materno-perinatal	2 475,7	252,8	971,2	1 189,1	62,6
1.1 Servicios de asistencia curativa	2 010,8	212,9	812,9	950,1	34,9
Partos y cesáreas	1 191,8(48,2)	100,9(39,9)	137,4(14,1)	918,7(77,3)	34,8(55,6)
Complicaciones en el embarazo, parto puerperio y recién nacido	757,7(30,6)	97,1(38,4)	692,2(64,8)	31,4(2.6)	NI d
Otros	61,3(2,7)	14,9(5,9)	46,3(4,8)	0,0(0,0)	0,1(0,2)
1.2.- Servicios auxiliares de atención de la salud	51,2(2,1)	NI	NI	49,9(4,2)	1,3(2,0)
1.3- Productos médicos dispensados a pacientes ambulatorios	67,6(2.7)	1,0(0,4)	NI	66,6(5,6)	NI
1.4- Servicios de prevención y de salud pública	346,1(14,0)	38,9(15,4)	158,3(16,3)	122,5(10,3)	26,4(42,2)
2.-Planificación familiar	171,3	81,9	53,5	31,6	4,3
2.1 Servicios de asistencia curativa	34,0(19,9)	14,5(17,7)	19,5(36,5)	NI	0,0(0,7)
2.2 Productos médicos dispensados a pacientes ambulatorios	59,4(34,7)	9,3(11,4)	14,3(26,7)	31,6(100,0)	4,2(97,0)
2.3 Servicios de prevención y de salud pública	77,9(45,4)	58,1(70,9)	19,7(36,8)	NI	0,1(2,3)
3.-Cáncer Cervicouterino	165,1	26,5	86,3	50,4	1,9
3.1- Servicios de asistencia curativa	145,2(87,9)	6,8(25,7)	86,3(100,0)	50,4(100,)	1,7(91,5)
3.2-Servicios auxiliares de atención de la salud	15,2(9,2)	15,0(56,6)	NI	NI	0,2(8,5)
3.3.-Servicios de prevención y de salud pública	4,7(2,99	4,7(17,7)	NI	NI	NI
4.-cáncer de mamá	63,7	10,4	40,1	0,6	12,6
4.1- Servicios de asistencia curativa	58,0(91,1)	5,0(48,1)	40,1(100,0)	0,6(100,0)	12,3(97,8)
4.2-Servicios auxiliares de atención de la salud	0,4(0,6)	0,1(1,0)	NI	NI	0,3(2,2)
4.3.-Servicios de prevención y de salud pública	5,3(8,3)	5,3(51,0)	NI	NI	NI

[a] En millones de dólares estadounidenses. Tipo de cambio: 1 dólar estadounidenses =10,78 pesos mexicanos
[b] ONG: organización no gubernamental
[c] Otros: abortos embarazos ecnotópicos y morales y puerperio quirúrgico
[d] NI: Información desconocida

atención de complicaciones tanto durante el embarazo y el puerperio como en el recién nacido (cuadro 2).

Se debe subrayar que si bien las complicaciones representaron 30,6% del gasto total en este programa, los agentes de la seguridad social le destinaron 64,8% de su gasto en salud materno-perinatal (cuadro 2).

El gasto en los servicios de prevención y salud pública (como las consultas prenatales) representó 14,0% del gasto en salud materno-perinatal, aunque estos servicios representaron 42,2% del gasto de las empresas privadas de seguro y las ONG en este programa (cuadro 2).

Los servicios destinados a la planificación familiar representaron 5,9% del gasto total en salud reproductiva y fueron financiados mayoritariamente por los agentes del sector público (cuadro 1). La función de salud a la que los agentes de financiamiento destinaron mayores recursos dentro de este programa fue la prevención (consultas y asesorías de planificación familiar) (cuadro 2). La adquisición de métodos anticonceptivos (englobada en productos médicos dispensados a pacientes ambulatorios) representó 34,7% del gasto en planificación familiar. El patrón de distribución del gasto de los agentes de financiamiento por funciones no fue homogéneo: mientras los agentes privados dedicaron la mayor proporción (97,0%) de su gasto a la adquisición de productos médicos, las entidades del gobierno lo hicieron en los servicios de prevención. La seguridad social, en cambio, equilibró su gasto de planificación familiar entre los servicios de asistencia curativa, los productos médicos y los servicios de prevención (cuadro 2).

En general, 5,7% del gasto en salud reproductiva se concentró en el programa de cáncer cervicouterino y 2,2% en el de cáncer de mama (cuadro 1). En ambos casos, el gasto principal se dedicó al tratamiento de esas enfermedades en los servicios de asistencia curativa (cuadro 2). En el caso del cáncer cervicouterino, la segunda función con mayor gasto fueron los servicios auxiliares de atención de la salud (debido fundamentalmente al gasto en las pruebas citológicas), mientras que para el cáncer de mama, la segunda función con mayor gasto fue la relacionada con los servicios de prevención (8,4%), ambas financiadas casi exclusivamente por el estado (cuadro 2). La seguridad social fue el principal agente de financiamiento, tanto para el diagnóstico y tratamiento del cáncer cervicouterino (52,3%) como del de mama (63,0%) (cuadro 1).

El gasto relacionado con la rectoría y administración de los servicios de salud y con los seguros médicos representó 0,9% del gasto total en salud reproductiva, mientras que a otras funciones relacionadas con la salud omo la formación bruta de capital y de personal sanitario, así como las actividades de investigación y desarrollo correspondió 0,3% de ese gasto. El financiamiento de ambas actividades estuvo totalmente a cargo de agentes del sector público (cuadro 1).

En cuanto a los proveedores, 72,9% del gasto en salud reproductiva correspondió a los hospitales y 21,2% a los proveedores de atención ambulatoria (cuadro 3). Mientras el gasto en salud materno-perinatal se concentró en los hospitales (para la atención de los partos, las cesáreas y las complicaciones), el gasto en planificación familiar se concentró en los proveedores de atención ambulatoria, donde se brindaron las consultas y asesorías de planificación familiar (43,5%). En general, 74,9% del gasto en cáncer cervicouterino se destinó a pagar a los proveedores de atención ambulatoria (quienes brindaron consultas especializadas en este tipo de cáncer y realizaron pruebas citológicas y biopsias, entre otras tareas); 82,1% del gasto en cáncer de mama correspondió a los hospitales (cuadro 3).

Al igual que a nivel nacional, el gasto público de los estados en salud reproductiva se concentró en el programa de salud materno-perinatal y en el de planificación familiar (77,5% y 10,5%, en promedio, respectivamente). El programa de cáncer cervicouterino representó 8,1% de ese gasto y el de cáncer de mama 3,1%, mientras la rectoría y administración de la salud y las funciones de formación de capital, de personal sanitario y de investigación y desarrollo, en conjunto, representaron en promedio 0,8% del gasto de los estados (figura 2).

El promedio del gasto público por beneficiaria en salud reproductiva a nivel estatal fue de 680,03 dólares estadounidenses. En los estados se observó una relación directa entre el gasto público en salud reproductiva por beneficiaria y el PIB anual per cápita y entre el gasto público en salud per cápita y el gasto público en salud reproductiva por beneficiaria (figura 3). Según estos resultados, los estados con mayor PIB tuvieron mayor gasto público en salud reproductiva por beneficiaria ($r = 0,75$, $P < 0,001$) y los estados donde el gasto público per cápita en salud fue alto, también fue mayor el gasto público en salud reproductiva por beneficiaria ($r = 0,80$, $P < 0,001$). Vale la pena resaltar los casos de Baja California Sur y Yucatán, ya que tuvieron un mayor gasto público en salud reproductiva por beneficiaria que otros estados con niveles similares de PIB y de gasto público en salud per cápita. Por el contrario, el estado de Guerrero tuvo el menor gasto público en salud reproductiva por beneficiaria, a pesar de que su PIB anual y su gasto público en salud per cápita fueron similares a

Cuadro 3. Gasto estimado en Salud reproductiva según los agentes de financiamiento, por programa. México, 2003[a]

Programa	Total°	Hospitales	Proveedores de atención ambulatoria	Farmacias	Programas de Salud Pública	Administración general de la salud
Salud materno-perinatal	2475,7	1 993,4(80.5)	412,0(16,)	67,0(2,7)	3,3(0,1)	NI b
Planificación familiar	171,3	36,9(21.5)	74,5(43,5)	59,4(34,7)	0,5(0,3)	NI
Cáncer Cervicouterino	165,1	39,5(23,9)	123,6(74,9)	NI	2,0(1,2)	NI
Cáncer de mamá	63,7	52,3(82,1)	8,7(13.7)	NI	2,7(4,2)	NI
Rectoría y administración de la salud y los seguros médicos	26,5	NI	NI	NI	NI	26,5(100)
Formación de capital, formación de personal sanitario e investigación y desarrollo	10,3	NI	NI	NI	NI	10,3(100)
Total	2912,6	2 122,1(72.9)	618,8(21,2)	126,4(4,3)	8,5(03)	36,8(1,3)

[a] En millones de dólares estadounidenses. Tipo de cambio: 1 dólar estadounidenses =10,78 pesos mexicanos.
[b] NI: Información desconocida

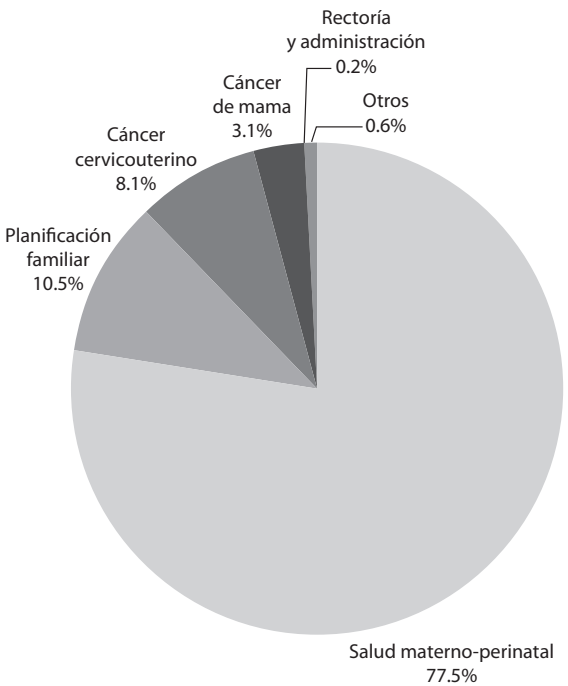


Figura 2. Distribución del gasto público promedio en salud reproductiva a nivel estatal. México, 2003

los de otros estados como Tlaxcala que tuvieron un mayor gasto en salud reproductiva.

Discusión

La importancia de que la población disfrute de una buena salud reproductiva es vital para poder alcanzar los Objetivos de Desarrollo del Milenio, ya que la pobreza y la mala salud reproductiva están íntimamente ligadas.[35] Las poblaciones más pobres y marginadas presentan por lo general los peores indicadores de salud reproductiva (mayor número de hijos de los deseados o planeados, mayores complicaciones durante el parto, el aborto y el puerperio, elevada morbimortalidad materna y perinatal, alta prevalencia de infecciones de transmisión sexual e índices elevados de embarazo precoz, abandono escolar y orfandad prematura). Todo esto contribuye a perpetuar el círculo vicioso de la pobreza. A pesar de ello, la competencia por recursos en salud, las presiones ideológicas y la existencia de diversos padecimientos emergentes han reducido los esfuerzos dirigidos a mejorar la salud reproductiva.

Conocer el gasto que un país realiza en salud reproductiva es indispensable para velar por el cumplimiento de los compromisos y las acciones a nivel nacional e internacional; identificar los programas, las actividades, las funciones o los grupos de la población que se encuentran subfinanciados; y reorientar la asignación del presupuesto de acuerdo con las necesidades, las prioridades e interven-

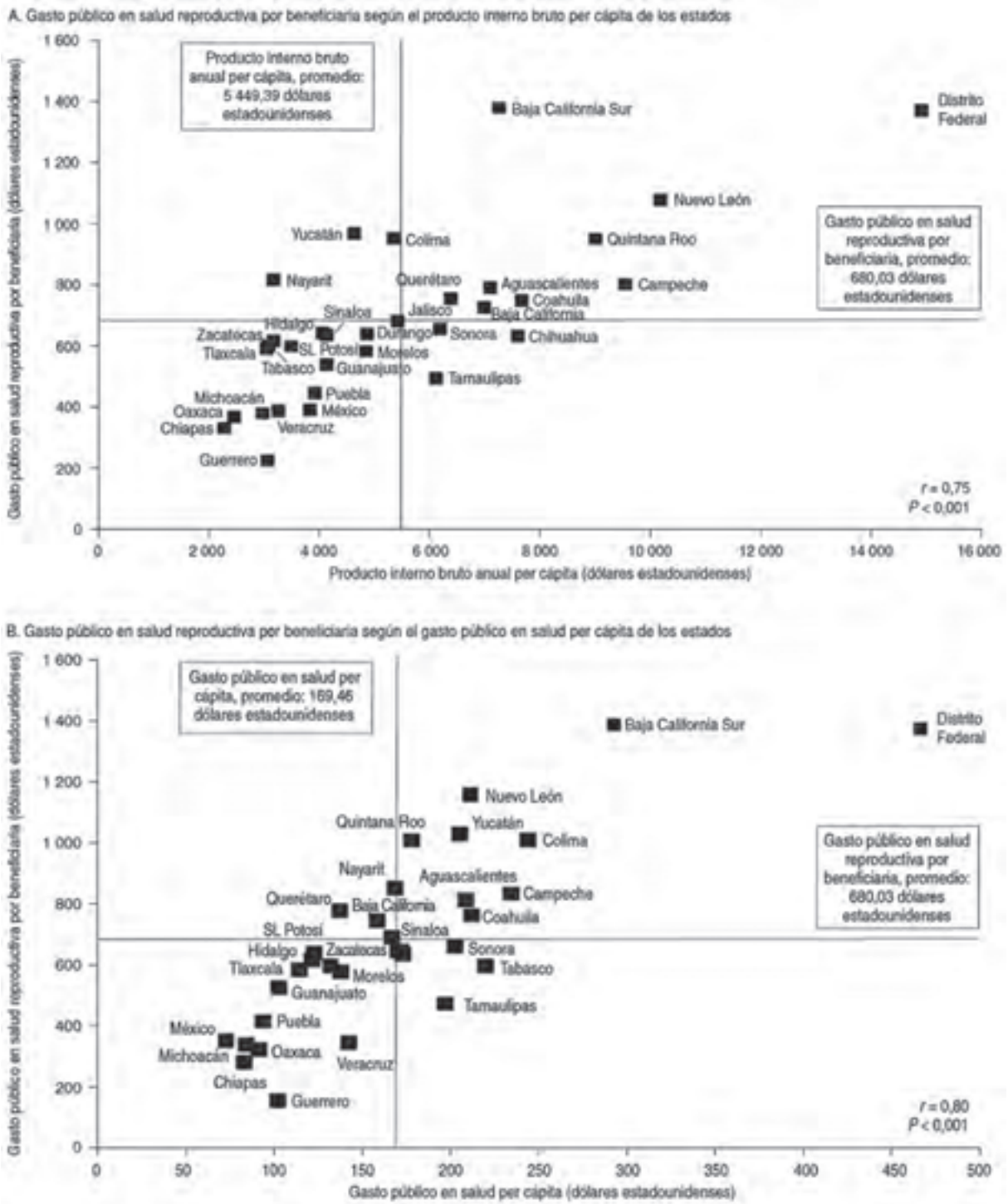


Figura 3. Gasto público en salud reproductiva por beneficiaria y su relación con el gasto público per cápita en salud y el producto interno bruto per cápita. México, 2003[a]

ciones que han demostrado tener una mayor efectividad en función del costo. Por otro lado, conocer la estructura del gasto en salud reproductiva permite realizar comparaciones entre instituciones, localidades y países en diferentes contextos, como un insumo adicional para la toma de decisiones y una forma de aumentar la transparencia y la rendición de cuentas.

Este trabajo contribuye a conocer el panorama financiero de la salud reproductiva en México, mediante una adaptación de la metodología de cuentas en salud, y brinda información para la evaluación del desempeño y el seguimiento del efecto de las políticas y las reformas relacionadas con la asignación de recursos.

Los resultados obtenidos muestran que, al igual que en el gasto total en salud, la salud reproductiva se financió en gran medida mediante el pago directo de los hogares. El gasto de la seguridad social representó un porcentaje del gasto en salud reproductiva mayor que del gasto en salud (40,2% frente a 31,0%, respectivamente). Si bien estas cifras parecen indicar una mejor distribución de la carga financiera de la salud reproductiva frente al gasto total en salud, la fuerte contribución de los pagos directos de los hogares es un importante reto para el sistema de salud mexicano. La puesta en marcha del Seguro Popular, cuyo catálogo de intervenciones abarca la mayoría de las actividades de salud reproductiva estudiadas, busca revertir esta situación y proteger a las familias de incurrir en gastos en salud que podrían afectar más aun a su situación económica. Análisis posteriores de contabilidad en salud deben evaluar si la implantación de este nuevo seguro permitirá reducir los pagos directos de los hogares en esta área, ya que estos afectan más a las mujeres de bajos ingresos, las indígenas, las adolescentes y a otros grupos prioritarios de la población. Es precisamente con respecto a estos grupos poblacionales más desfavorecidos que se plantean los mayores retos y se requiere fortalecer los programas de salud reproductiva.

La metodología utilizada permite, además, especificar la distribución del gasto en los principales programas y las diferentes funciones en salud reproductiva. Este punto es de especial importancia dado que el Gobierno mexicano ha establecido compromisos para alcanzar los Objetivos de Desarrollo del Milenio relacionados con la reducción de la mortalidad materna y en niños menores de cinco años,[36] lo que ha llevado a establecer explícitamente metas nacionales en el Plan Nacional de Salud 2001±2006.[37] Entre estas metas nacionales se encuentran garantizar condiciones de equidad en el comienzo de la vida mediante actividades que garanticen un embarazo planeado y deseado, la atención prenatal adecuada y el nacimiento con un mínimo de riesgos; aumentar la cobertura de detección temprana de cáncer cervicouterino y disminuir la tasa de mortalidad por esta enfermedad; reducir la tasa general de fecundidad a 2,1 hijos por mujer; y detener el aumento en la tasa de mortalidad por cáncer de mama.

Al igual que en otros países,[38±40] en México se dedica la mayor proporción del gasto en salud reproductiva al programa de salud materno-perinatal. A pesar de que el rubro con mayor gasto fue el de partos y cesáreas, llama la atención el alto monto destinado a la atención de complicaciones en el embarazo, el parto, el puerperio y el recién nacido, que asciende a más del doble del empleado en acciones preventivas en salud materno-perinatal e incluso supera varias veces el destinado a los otros programas de salud reproductiva. Si bien el mayor tiempo de estancia hospitalaria es una explicación para este hecho, los resultados parecen indicar que esta situación responde al uso ineficiente de los recursos dedicados a la atención obstétrica, lo que deberá analizarse a la luz de las recomendaciones de la OMS.[41] Se requiere, por tanto, realizar un estudio en profundidad para esclarecer las causas de estas complicaciones, la comparación entre el número de complicaciones y el número de partos por institución y su relación con la cobertura eficaz del control prenatal, tanto en el ámbito nacional como estatal.

Otro punto a resaltar es la forma en que los agentes de financiamiento distribuyen el gasto entre las funciones de salud. Mientras los pagos directos de los hogares se dirigen a la atención de los partos y las cesáreas y a la atención prenatal, el gasto de la seguridad social se dedica al tratamiento de complicaciones durante el embarazo, el parto y el puerperio y a atender los casos de cáncer cervicouterino y de mama. Se debe subrayar que el monto del gasto público destinado por la seguridad social a atender las complicaciones es 4,6 veces el monto gastado por ese mismo agente en la atención de partos y cesáreas.

Con relación al gasto realizado por los proveedores de salud, algunos elementos pueden ayudar a mejorar el uso de los recursos. La concentración del gasto en actividades hospitalarias en detrimento de las actividades preventivas como las consultas de control prenatal, de recién nacido sano y de puerperio y las asesorías de planificación familiar podría ser, en parte, el reflejo de los problemas anteriormente señalados. No se puede descartar, sin embargo, que otros factores relacionados con la oferta o la demanda de los servicios de salud puedan estar influyendo en esta forma de distribución del gasto. Por ejemplo, el sistema de referencia y contrarreferencia en las instituciones pertenecientes a la

Secretaría de Salud de un estado y las preferencias de la población condujeron a la saturación del servicio de urgencias en un hospital, cuando en realidad muchos de esos partos se hubieran podido atender en centros de salud.[42] Es necesario, por tanto, profundizar en el análisis de estos factores y valorar si realmente se está cumpliendo el objetivo de fortalecer la capacidad resolutiva del nivel de atención primaria propuesto en el Plan Nacional de Salud.[37]

El gasto público realizado en los diferentes estados presentó una gran heterogeneidad. La asociación directa observada entre el gasto público por beneficiaria, el gasto público en salud y el PIB anual per cápita de los estados indica que el proceso de descentralización no ha logrado aún revertir la tendencia histórica en la distribución del gasto público y que todavía no se asignan los recursos públicos de acuerdo con las necesidades locales de salud. Asimismo, llama la atención que estados con el mismo nivel de PIB y gasto público en salud per cápita tengan tan diferentes niveles de gasto en salud reproductiva. Si bien esto podría ser producto de diferentes necesidades en salud, es necesario profundizar en este análisis para establecer cuál podría ser la asignación óptima de recursos en cada estado, dadas sus características, necesidad y disponibilidad financiera. Se debe evaluar si también hay asociación entre el gasto en salud reproductiva y otros indicadores de salud, como la tasa de mortalidad materna, por cáncer cervicouterino y de mama y la tasa de fecundidad. Un análisis reciente de la relación entre la cobertura y el financiamiento del programa de planificación familiar encontró que, si bien el gasto público está asociado negativamente con la proporción de mujeres en edad fértil (indicador de demanda potencial de servicios de planificación familiar) en un estado, no se observó una asociación significativa con otros indicadores compuestos de necesidades de salud en planificación familiar.

A pesar del esfuerzo realizado en la construcción de las cuentas en salud reproductiva, se presentaron limitaciones en su estimación y construcción. Debido a que la ENIGH no tiene representatividad estatal, no se pudo estimar el gasto privado a ese nivel y la información desagregada de los gastos correspondientes a los diferentes programas de salud no estuvo disponible en todos los estados. Asimismo, las limitaciones de las encuestas utilizadas solo permitieron calcular parcialmente el gasto en displasias, cáncer cervicouterino y de mama, por lo que los pagos directos de los hogares en esos rubros están subestimados. El análisis presentado para cada estado se refiere al gasto por beneficiaria y no al gasto per cápita, medida generalmente utilizada en la comparación del gasto. La gran variabilidad en los datos informados por las diferentes fuentes oficiales con respecto a la población a la que cada institución da cobertura, tal y como se señala en el informe de OECD,[43] constituyó un importante reto para la construcción de estos indicadores. Esta heterogeneidad obligó a utilizar distintos métodos de estimación.

Los resultados obtenidos solo representan el panorama financiero de un conjunto de actividades relacionadas con la salud reproductiva. Aun cuando la información presentada expone problemas de ineficiencia en el uso de los recursos, para evaluar el desempeño del sistema de salud es necesario tomar en consideración otros indicadores de salud y se debe analizar la tendencia del gasto.

A pesar de las limitaciones señaladas, este estudio es de gran utilidad y constituye el primer esfuerzo por desglosar la información financiera de las cuentas en salud según los programas específicos existentes en México, tanto a nivel nacional como estatal.

En el mundo son muy pocos los estudios que han aplicado este tipo de estudios a la salud reproductiva.[38±40]

Estos resultados permiten concluir que el gasto en salud reproductiva representó 0,5% del PIB mexicano en 2003 y poco más de 8% del gasto en salud y es mayor en agentes públicos (53,5%) que en privados (46,5%), lo contrario de lo que ocurre con el gasto total en salud. La distribución del gasto en salud reproductiva por beneficiaria a nivel estatal estuvo directamente asociada con la distribución del PIB y el gasto en salud per cápita.

En México se han logrado grandes avances en la recopilación y procesamiento de la información financiera, no solo de salud en general, sino también en el área específica de la salud reproductiva. Sin embargo, todavía quedan retos para el futuro. Se recomienda ampliar la definición de salud reproductiva y generar este tipo de información financiera de forma sistemática, institucionalizada y comparable. De esta manera se podrán construir series de tiempo que permitirán entender mejor las tendencias del gasto y su relación con los indicadores de salud. Además, esto permitirá evaluar el desempeño del sistema de salud y el impacto de medidas como la creación del Seguro Popular y favorecerá la rendición de cuentas en un contexto de mayor democracia.

Invertir en la salud reproductiva ayudará a reducir el crecimiento demográfico, optimizar los recursos educativos y laborales y, sobre todo, permitirá a las personas y a las parejas ejercer más plenamente sus derechos y aspiraciones reproductivas. Fortalecer las acciones y los programas de salud reproductiva en México a partir de una asignación del gasto basada en la evidencia y enfocada a

las poblaciones más desfavorecidas es un imperativo ético, de derechos humanos y de desarrollo.

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Aceptabilidad de los suplementos alimenticios del programa *Oportunidades**

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Entre 1990 y 1995 la población de México creció de 81 a 91 millones de habitantes.[1,2] Durante este periodo, en 1993, había en México 40 millones de pobres, de los cuales 13 millones se encontraban en situación de extrema pobreza.[3]

Para mediados de 1999 había en promedio 97 millones de mexicanos, de los cuales 40 millones seguían viviendo en la pobreza y 26 millones en pobreza extrema,[4,5] aunque algunos especialistas aseguran que los pobres ya eran mayoría.[6] En siete años el número de pobres extremos se había duplicado.

Ante este aumento de la población en pobreza extrema, durante la segunda mitad de los noventa, algunos programas gubernamentales destinados a combatir la pobreza se dirigían a ciertos sectores "prioritarios" y microrregiones del país en los que la situación era aún más extrema. Las categorías tradicionales de medición de la pobreza empezaban a perder la capacidad de explicar la situación en la que se encontraban estos sectores de la población que, según el Banco Mundial, sobreviven con menos de un dólar al día en una línea cercana a la indigencia, sobre todo en el medio rural.[7,8]

En 2002 se dieron a conocer nuevas cifras sobre pobreza en México y se dijo que la cifra alcanzaba 53.7% del total de la población;[9] el Banco Mundial comunicaba 46.8% de pobreza extrema.[7] Estos datos alarmantes revelan la profunda desigualdad social y económica que se vive en el país, situación que resulta más preocupante si se considera que en el tercer informe de gobierno el Presidente de la República declaró que la de México es la novena economía del mundo.[10] Éste es, en términos generales, el contexto en el que opera el Programa de Desarrollo Humano Oportunidades (*Oportunidades*), que en la actualidad llega a 4.2 millones de familias mexicanas.

El Programa de Desarrollo Humano Oportunidades aparece como un conjunto de acciones intersectoriales del gobierno federal que busca disminuir los índices de pobreza extrema en México. El programa incluye un componente educativo, uno de salud y uno enfocado a la nutrición. El componente alimentario cuenta con una línea de acción muy importante cuyos objetivos son mejorar el crecimiento infantil, disminuir la prevalencia de desnutrición y mejorar la toma de decisiones de nutrición en el hogar. Uno de los insumos con los que cuenta el programa es un suplemento dietético que contiene micronutrimentos esenciales para mejorar la nutrición de los grupos vulnerables: niños menores de cinco años y mujeres embarazadas y en periodo de lactancia.

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La desnutrición en la población menor de 5 años constituye un problema de salud pública en México, ya que existe una prevalencia de talla baja para la edad de 17.8%, mientras que 7.6% de los niños presenta peso bajo para la edad y 2.1% presenta peso bajo para la talla. Asimismo, se han identificado deficiencias de micronutrimentos y cifras del 27.2% de la población menor de esta edad con anemia. En mujeres en edad reproductiva la principal deficiencia que se observa es la de hierro, aunada a las de zinc y vitamina C.[11] Estas deficiencias imponen una carga importante sobre la salud de mujeres y niños en el país.

En los programas de suplementación nutricional es necesario asegurar la aceptabilidad del producto, así como su impacto en la población. El presente trabajo es resultado de la evaluación cualitativa realizada por el Instituto Nacional de Salud Pública acerca de la aceptabilidad de los suplementos alimenticios entre la población beneficiaria de *Oportunidades*.

El objetivo del estudio se centró en identificar usos y prácticas culturales que intervienen en la aceptación o rechazo de los suplementos nutritivos del programa *Oportunidades*. En este sentido, se entiende por usos y prácticas culturales locales a un conjunto de conocimientos que varían y que tienen sus particularidades a partir del contexto en el cual se reproducen. El empleo del término dieta resulta de importancia para el presente trabajo, ya que la dieta es el conjunto acostumbrado de alimentos preparados y consumidos regularmente en una cultura específica. Las diferencias de los patrones de consumo entre individuos, unidades domésticas o comunidades indican el lugar social dentro de grupos sociales más incluyentes. La dieta también evidencia la transformación social y cultural debido a que grupos humanos localizados abandonan la tradición a favor de tendencias alimentarias globales y estilos de vida en relación con ellas. Es importante destacar que en culturas que emplean "categorías humorales"*,[12] (como en algunas regiones de México) la aceptación de alimentos nuevos, sobre todo para bebés o niños, puede llevar en sí la combinación de esas categorías con nuevas nociones sobre lo "nutritivo" por parte de la comunidad que los adopta. No obstante, el sabor y el costo tienen mucho más impacto sobre la selección de alimentos que las cualidades simbólicas, lo que afecta el consumo de alimentos de los individuos que experimentan algún momento orgánico en particular (embarazo o enfermedad).[13]

Material y métodos

Se realizó un estudio cualitativo con entrevistas a profundidad, grupos focales y entrevistas a informantes clave como técnicas de levantamiento de información, enmarcadas en una aproximación de diagnóstico rápido ±RAP por sus siglas en inglés±.[14]

El estudio se realizó durante los meses de noviembre y diciembre de 2002 en cuatro comunidades beneficiarias del programa, cada una perteneciente a un estado del norte, centro, sur y sureste del país: Tamaulipas, Guanajuato, Chiapas y Veracruz. Se realizaron en total 43 entrevistas a profundidad a madres de niños menores de cinco años, mujeres embarazadas y en periodo de lactancia (MEPL) a quienes se dirige el programa; nueve entrevistas a informantes clave en las que se identificó, sobre todo, personal responsable de la operación del programa en la localidad; se realizaron ocho grupos focales con mujeres usuarias y MEPL para complementar la información de las entrevistas. También se llevó a cabo una práctica de observación directa en las comunidades. El cuadro I reseña estas características.

La información de las entrevistas y los grupos focales se analizó por medio del software para análisis cualitativo Atlas.ti v.4.2.

Resultados

La población estudiada

Las comunidades estudiadas en cada estado eran rurales. La edad promedio de las entrevistadas se ubicó entre 25 y 30 años y su principal ocupación fue el hogar, con trabajo eventual en el campo o como empleadas domésticas. La mayoría de las entrevistadas no contaba con seguridad social. En cuanto a las características de la unidad doméstica, predominó la familia nuclear, el número promedio de hijos por familia fue de tres y la escolaridad promedio de ambos cónyuges, de primaria incompleta. Las principales ocupaciones de los varones fueron la agricultura y la albañilería; se identificó como una experiencia común entre ellos la migración hacia el interior de la República o hacia Estados Unidos. En general, cuando las entrevistadas y sus parejas desempeñan trabajos remunerados lo hacen en los empleos más bajos y peor pagados de la escala laboral. La carencia de fuentes de empleo en las comunidades, sobre

* Se conforman de cuatro cualidades básicas: calor, frío, sequedad y humedad. Es un sistema de valores presente en culturas mestizas e indígenas, donde el modelo común de oposiciones está presente. La dicotomía frío-calor es la base de equilibrio y donde el exceso de estas cualidades condicionan desquilibrio. En lo particular se orientan hacia el cuidado de la salud, tipo y consumo de alimentos.

Cuadro I. Reseña metodológica

Lugar donde se obtuvo la información	Número y tipo de informantes*	Técnicas de levantamiento de información	Características de los grupos focales
Güémez, Tamaulipas	• 13 usuarias del programa (embarazadas, mujeres lactantes, mujeres con hijos menores de cinco años) • Cuatro responsables del programa en la localidad • Una promotora del programa	• Entrevistas a profundidad • Grupos focales • Observación directa • Pláticas informales	Se formaron dos grupos con mujeres lactantes, embarazadas o con menores de cinco años (con seis participantes en cada uno)
El Bajío Bonillas, Guanajuato	• 12 usuarias del programa (embarazadas, mujeres lactantes, mujeres con hijos menores de cinco años) • Una vocal del programa en la localidad	• Entrevistas a profundidad • Grupos focales • Observación directa • Pláticas informales	Se formaron dos grupos con mujeres lactantes, embarazadas o con menores de cinco años (con ocho participantes en cada uno)
El Ejido Pedernal, San Cristóbal de las Casas, Chiapas	• Nueve usuarias del programa (embarazadas, mujeres lactantes, mujeres con hijos menores de cinco años) • Dos responsables del programa en la localidad	• Entrevistas a profundidad • Grupos focales • Observación directa • Pláticas informales	Se formaron dos grupos con mujeres lactantes, embarazadas o con menores de cinco años (10 participantes en cada uno)
Tres Zapotes, Veracruz	• Nueve usuarias del programa (embarazadas, mujeres lactantes, mujeres con hijos menores de cinco años) • Una responsable del programa en la localidad	• Entrevistas a profundidad • Grupos focales • Observación directa • Pláticas informales	Se formaron dos grupos con mujeres lactantes, embarazadas o con menores de cinco años (nueve participantes en uno y 10 en otro)

* El criterio para seleccionar a las mujeres participantes fue que estuvieran recibiendo los suplementos nutricionales de Oportunidades. El criterio para seleccionar a los informantes clave fue su vinculación con la operación del mismo en cada localidad. Generalmente quienes participan en los comités como vocales o promotoras son mujeres de la misma localidad.

todo en las de Chiapas, Guanajuato y Veracruz, fue evidente; por esta razón, en la comunidad de Guanajuato 45% de la población masculina migra a Estados Unidos.[15]

Los productos que conforman la base dietética de las familias visitadas son tortillas de maíz (de harina en Tamaulipas, y en Guanajuato de maíz y harina), frijol, huevo, arroz, verduras y frutas en menor medida; en ocasiones la carne, en especial de pollo y cerdo. En la comunidad de Chiapas el maíz es una de las principales fuentes de alimentación. En esta comunidad, como en algunas familias de las otras comunidades visitadas, las entrevistadas coincidieron en señalar que en ocasiones tienen problemas para solventar la alimentación familiar debido a sus escasos recursos económicos.

El programa

En agosto de 1997 entró en acción el Programa de Educación, Salud y Alimentación Progresa. En marzo de 2002 Progresa se convirtió en el Programa de Desarrollo Humano Oportunidades.

Las madres de niños menores de cinco años y las mujeres embarazadas y en periodo de lactancia que son beneficiarias del programa deben asistir cada mes a su Centro de Salud, donde reciben una consulta médica en la que se registra su peso y talla; asisten a una plática sobre salud familiar y nutrición, y se les entrega una cantidad promedio de seis sobres de suplementos alimenticios por beneficiaria.

En todas las comunidades estudiadas se cuenta con comités integrados por miembros de la comunidad, casi siempre mujeres, encargados de informar, vigilar y supervisar la adecuada distribución de los suplementos, así como de otros beneficios otorgados por el programa.

A partir de los testimonios de los informantes clave se identificaron problemas de falta de abasto de suplementos en las comunidades de Guanajuato y Chiapas hasta por periodos de dos meses. También se identificaron problemas de organización al interior de la comunidad en los

cuatro estados visitados. Estos problemas tenían que ver con cuestiones de organización por parte de algunas promotoras del programa, comercialización de los productos e inconformidades por la petición de cooperaciones para solventar gastos de logística y movilización de miembros de los comités en las comunidades, de lo cual es muestra el siguiente testimonio:

> [...] porque ya también sabemos que en los mercados, las combis de Tenexapa cerca de San Cristóbal, los sobres de papilla allá los están vendiendo en el mercado de San Cristóbal [...] y algunas comunidades lo están vendiendo a San Cristóbal en el mercado a peso el sobre [...]

Las madres de niños menores de cinco años

Preparación del suplemento alimenticio. El suplemento para niños menores de cinco años es una sustancia en polvo que se mezcla con agua hasta obtener una consistencia espesa, como papilla. Se presenta en sabores de plátano, chocolate y vainilla. En las cuatro comunidades las madres utilizan sobre todo dos términos para referirse al suplemento: "papilla" y "leche".

Todas las entrevistadas empezaron a ofrecer a sus hijos el suplemento de la manera antes indicada, pero ellos no lo aceptaron. A la mayoría de los niños no le gusta el suplemento en forma de papilla, así que las madres buscaron formas alternativas de preparación.

Formas alternativas de preparación y consumo. Las mujeres optaron por diferentes combinaciones en la búsqueda de una preparación mejor aceptada, por lo que hoy en día el suplemento se prepara y consume de formas muy diversas. Así, el suplemento se combina en cada comunidad con alimentos y frutas propios de la región y, en ocasiones, su preparación depende del clima y las estaciones del año. De esta manera, en Tamaulipas el suplemento se consume con avena, en panecillos, atole en época de frío y a manera de "chongos" o "congeladas" en época de calor. En Guanajuato se combina con leche de vaca, con té de canela, atole, arroz con leche, cajeta y mezclado con maíz en polvo ±a esta forma de preparación se le conoce como "pinole"±; en esta comunidad también es común que los niños consuman el suplemento en polvo directamente del sobre. En Veracruz también se consume con atole, con café, té de canela, arroz con leche, con cereal y en polvo. En Chiapas se combina con café, atole de arroz, té de canela y en ocasiones se acompaña con tortillas o galletas. Algunas de las formas de preparación antes mencionadas incluyen métodos de cocción, con los cuales el suplemento pierde algunas propiedades nutritivas.

> [...] A veces también así lo hago, así, en agua hervida o si no así revuelta con café, si no con tortilla. Sí, así lo vamos cambiando, [el agua] hierve 20 minutos.

Consumo y distribución en la familia. Según los informantes clave entrevistados, al comienzo del programa muy pocos niños consumían el suplemento, pero con el paso del tiempo ±y con nuevas alternativas de preparación y consumo± son cada vez más los que lo consumen y está más extendida su aceptación.

No obstante que los niños beneficiarios del programa eran los que más consumían los suplementos, otros miembros de la unidad doméstica también participaban en el consumo, en particular los hermanos, aunque en ocasiones se incluía a los abuelos en caso de familias extensas. Muy pocas entrevistadas manifestaron que su pareja consumiera el suplemento. En la comunidad chiapaneca la mayoría de los miembros de las familias entrevistadas consumía suplemento, de lo cual se deduce que el número de veces y las cantidades de consumo del niño beneficiario son menores.

Resultó un hecho común que las familias visitadas tuvieran un excedente de uno o dos sobres, situación que ocurría mes con mes. En ocasiones, estos excedentes se regalan a familiares o vecinos. A través de la comunidad se extiende una red para regalar e intercambiar suplementos. Si bien no se identificó un sabor preferido por los beneficiarios en ninguna de las cuatro comunidades, en algunas familias los niños beneficiarios tienen un sabor preferido, y cuando los sobres de ese sabor se acaban algunas madres intercambian sobres. Por estas redes los suplementos llegan a algunas familias muy pobres que no son beneficiarias del programa y a quienes se les acabaron antes del fin de mes, y al mismo tiempo es la forma en que los que no los consumen se deshacen de ellos.

En las cuatro comunidades se identificó la utilización de dichas redes para vender los suplementos. Algunas personas simplemente los tiran a la basura o se los dan de comer a los animales de granja, práctica más extendida al inicio del programa.

Valoración de la consistencia. En general, los niños no aceptan la consistencia semisólida del suplemento y sus madres buscan maneras alternativas de prepararlo. La más frecuente es en forma líquida, de "leche" y, de acuerdo con la edad del niño, se sirve en vaso o biberón. No obstante,

esta preparación, aunque líquida, no tiene la misma consistencia de la leche, pues algunas madres comentaron que era necesario agrandar el orificio del biberón para que no se tapara. Es común que a esta preparación se agregue azúcar y frutas, por lo que adquiere más bien el cuerpo de un licuado o una malteada.

Complemento o sustituto de la alimentación. Predomina una percepción del suplemento como "leche", pues para la mayoría de las entrevistadas tiene apariencia de leche y sabe a leche, además de que se preparara y se consume como tal. La leche es un elemento importante en la dieta de los mexicanos. Forma parte de la canasta básica de alimentos y México ha sido durante muchos años, por lo menos en la última década, uno de los primeros importadores de leche en polvo en el mundo.[16] Así que la leche se considera en general un elemento más de la dieta y el suplemento percibido como tal tiende a remplazarla.

> -Ah sí, yo pienso que es un sustituto de la leche...
> -[…] Pero y la demás gente, ¿usted qué cree, que la ve como un sustituto de la leche?.
> -Pues sí. O sea, económicamente sí, porque si le da papilla ya no compran leche, o sea, sí, sí, yo [pienso que esto se da] por la necesidad que hay.

Otro factor que interviene para que la gente relacione el suplemento con la leche es el hecho de que otros programas de asistencia social, como Alimenta, distribuyen sobres de leche en polvo en las comunidades. El suplemento también viene en sobres y su presentación es en polvo, las madres lo preparan como leche y para ellas tiene más o menos el mismo sabor que ésta.

Lo anterior, además del factor económico que limita la compra de leche, determina que el suplemento se considere no un complemento de la alimentación sino un alimento por sí mismo y tiende, en la mayoría de los casos, a incorporarse a la dieta como sustituto de dicho producto. Entendido como un alimento "completo", se combina de diversas formas como se combinaría la leche: con arroz, cereal o frutas.

Varias entrevistadas coincidieron en señalar que el suplemento era una ayuda para ellas porque "a veces no hay para leche" y destinan para otras cosas el dinero que tenían para ese gasto; o bien, compran menos leche que la acostumbrada y combinan su consumo con el suplemento. El recibir suplementos se convierte en una estrategia para administrar de otra forma el gasto familiar. Pero muchas veces, sobre todo en las familias y comunidades más pobres donde el dinero es aún más escaso, el suplemento ocupa el lugar de la leche o la sustituye casi de manera permanente. En Guanajuato una madre les decía a sus hijos: "no importa si les gusta o no, es lo único que hay, así que cómanlo".

En la mayoría de las familias visitadas en Chiapas casi todos los miembros de éstas consumían el suplemento; al respecto comentaba un entrevistado: "[…] es un alimento y quita el hambre". Esto es así no obstante que en esta comunidad la leche no es un alimento de consumo culturalmente generalizado, a diferencia del café.

En las cuatro comunidades se identificaron algunos casos de niños que se alimentan sólo con suplemento, sobre todo aquellos que toman biberón. El suplemento constituía el único alimento durante el día ±aunque lo consumían varias veces al día±, pues según sus madres es lo único que "les cae bien".

Si bien se identificó una tendencia general a que el suplemento sustituya a la leche en la dieta familiar, también se identificaron algunos casos, por ejemplo en Tamaulipas, en los que el suplemento sí desempeña su función como complemento de la alimentación diaria de los niños: sus madres lo incluyen como postre o entre comidas.

Aceptabilidad y efectos negativos. En las cuatro comunidades se comprobó que en ocasiones, durante los primeros días de su consumo, el suplemento provoca malestares gastrointestinales, diarreas o vómitos; una expresión popular muy común es que "les cae de peso". De manera habitual, estos malestares desaparecen después de los primeros días mientras el organismo del niño se adapta al suplemento y sus madres continúan su administración, pues el personal de salud, por lo general, alerta sobre estos posibles efectos pasajeros; sin embargo, algunas madres decidieron suspender definitivamente el consumo del suplemento al percibir dichos malestares. En algunos de estos casos la suspensión del consumo se debió a una recomendación médica.

> No, me lo daban pero ¿sabe qué?, a mí me dio mucho vómito una vez que lo tomé y casi me desmayaba yo del vómito que me provocó, y le agarré asco, y nunca [más] la tomé, para qué la voy a engañar.

Aceptabilidad y percepción de cambios positivos. En general, la identificación de cambios positivos se asocia con el aumento de peso de los menores, mayor apetito, se "desarrollan" más ±crecimiento±; otras percepciones comunes son que incrementa su energía, mejora su estado de ánimo, de salud y disminuye la frecuencia de enfermedades respiratorias.

Las mujeres embarazadas y en periodo de lactancia

Preparación del suplemento alimenticio y valoración de su consistencia. En principio, la forma en que se prepara el suplemento alimenticio para las mujeres embarazadas y en periodo de lactancia difiere mucho de la que se usa en menores de cinco años, sobre todo por su consistencia. El suplemento para las embarazadas y en periodo de lactancia, según las indicaciones oficiales, adquiere en su preparación una consistencia líquida, como de leche. Todas las entrevistadas manifestaron estar de acuerdo con esta consistencia.

Aceptabilidad y percepción de cambios positivos. En las cuatro comunidades se encontró un número muy reducido de mujeres embarazadas. En Tamaulipas y Guanajuato se reconoció un consumo poco entusiasta del suplemento, mientras que en Veracruz las mujeres en este estado lo consumían sólo una vez al día, por la mañana.

En el caso del suplemento para las MEPL no es común que su consumo se comparta con otros miembros de la familia.

Si bien no se encontró un consumo generalizado del suplemento entre las MEPL, la principal razón de su consumo es que son conscientes de los beneficios para ellas y sus bebés. En el caso de las MEPL, el suplemento es más un complemento de su dieta diaria que sustituto de algún alimento.

Entre las embarazadas predominaron las percepciones acerca de que el suplemento aumenta su apetito y peso, y que ayuda al nacimiento de niños fuertes y a la formación del sistema óseo del bebé.

Según las mujeres en periodo de lactancia, el suplemento causa aumento de la producción y calidad de la leche materna, propicia el nacimiento de niños con un peso adecuado y un mejor desarrollo del bebé.

Aceptabilidad y efectos negativos. En las mujeres embarazadas son frecuentes las náuseas, no siempre en relación con el suplemento, sino con el embarazo en sí; sin embargo, algunas mujeres las relacionan en gran medida con el suplemento y suspenden su consumo.

Además de las náuseas, entre las MEPL se identificaron también diarreas. Estos malestares, igual que en el caso del suplemento para menores de cinco años, suelen desaparecer después de unos días, mientras el cuerpo se acostumbra al suplemento. No obstante, en algunos casos se suspendió el consumo de los suplementos cuando no era bien aceptado, ya sea por recomendación médica o por decisión propia, mientras que otras continuaron el consumo después que desaparecieron los malestares.

Discusión

No obstante que al inicio del programa los suplementos eran poco consumidos por la población, según los prestadores de servicios de salud entrevistados, en la actualidad esa tendencia cambió y el número de personas beneficiarias que los consume aumentó. Su aceptabilidad ha ido en aumento y ahora el suplemento es bien recibido por la mayoría de la población beneficiaria, según lo muestran estudios puntuales en varios estados de la República.[17]

Por otra parte, la consistencia y el sabor de los suplementos resultan ajenos a la dieta diaria de los niños beneficiarios en las comunidades visitadas; por lo tanto, las madres buscaron formas alternativas y muy variadas de preparación y consumo, de acuerdo con los usos y prácticas alimentarias locales. Una estrategia presente en los distintos contextos estudiados fue la combinación del suplemento con alimentos que forman parte de la dieta cotidiana.

El concepto de "complemento alimenticio" parece tener un lugar muy particular en el imaginario cultural alimentario de las comunidades que colaboraron en el presente estudio. El aspecto y el sabor de la papilla, más que propiciar su aceptación, evidencia su relación con algo ajeno a la dieta local, que sabe mal y cuyo consumo es obligatorio. El suplemento, entendido como un alimento en sí mismo y no como complemento, tiende a asociarse con la leche y a integrarse como tal en la dieta cotidiana de la población beneficiaria.

El éxito de los suplementos dietéticos en la mejora del estado nutricional de la población tiene relación directa con la aceptación y el nivel de consumo que logran en la diversidad de ámbitos socioculturales en que dicha población se encuentra inserta. El hecho de que un suplemento no cumpla su función de complemento alimenticio y en la práctica sustituya a un alimento de vital importancia en la dieta de la población a la que se dirige, como es la leche, constituye un obstáculo en la consecución de los objetivos trazados en el componente de Alimentación del programa *Oportunidades*, al mismo tiempo que modifica la organización cultural de la alimentación en las comunidades a las que se dirige.

Cambiar la presentación y la consistencia de los suplementos dirigidos a los menores de cinco años para que resulten más comunes para la gente podría mejorar su aceptación por parte de la población.

Se recomienda la elaboración de campañas informativas que incluyan pósteres, carteles y otros recursos didácticos donde se resuman los principales beneficios del consumo de suplementos para el niño y la mujer, con casos concretos como ejemplos. El papel de la madre resulta estratégico para mejorar la salud de los niños y otros miembros de la familia; en ellas deben centrarse los esfuerzos para transmitir la importancia de un adecuado consumo de los suplementos. De igual manera, resultaría benéfica la elaboración de pequeños folletos o manuales dirigidos al personal de salud de primer nivel, en los que se identifiquen los riesgos y problemas más comunes en el consumo de los suplementos, la importancia del seguimiento y un control riguroso de su consumo. Beneficiaría también incluir las instrucciones para el personal de salud, para que informen e instruyan a la gente acerca de la composición nutricia del suplemento, con el fin de evitar la proliferación de ideas erróneas en torno a él.

A la fecha, en el territorio nacional conviven alrededor de 56 grupos étnicos, cuyos orígenes culturales, costumbres, visiones del mundo y prácticas alimentarias difieren unas de otras. Evaluaciones de la aceptabilidad de los suplementos dietéticos de programas de asistencia social se han llevado a cabo previamente,[18,19] sin embargo, han sido estudios realizados en una sola comunidad y en un solo estado del país.

Las evaluaciones de la aceptabilidad de los suplementos dietéticos que otorga *Oportunidades* y su aparente éxito[20] no deben desligarse de su relación con el éxito obtenido por otros componentes del programa, sobre todo por el componente de salud, en el que se debe resolver la escasez de medicamentos y el acceso a servicios de salud de segundo y tercer nivel, y tampoco fuera de su relación con el avance en otros ámbitos importantes del combate a la pobreza, de manera concreta, en este caso, la generación de empleos y las limitadas oportunidades de educación media superior y superior para amplios sectores de la población.

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The *Oportunidades* program increases the linear growth of children enrolled at young ages in urban Mexico*[1,2]

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Introduction

Undernutrition in children is one of the most important public health challenges in developing countries. Globally, 26.5% of all children under the age of 5 (or 147.5 million children) experience linear growth retardation secondary to poor nutrition, and 126.5 million children are underweight.(1) Undernutrition is the major cause of postneonatal child mortality because it drastically increases the case-fatality rates of infectious diseases. More than half of the current deaths among children <5 y of age would be averted if children were well nourished when they became ill.(2,3) Undernutrition in school-age children adversely affects school attendance, performance, and learning. As the probability for catch-up growth is limited, a stunted girl is very likely to become a stunted adolescent and later a stunted woman. This directly affects her health and productivity, but adult stunting and underweight also increases the odds of having low-birthweight children. Undernutrition during infancy and early childhood thus has profound negative short-term, long-term, and intergenerational effects.(4)

According to a national probabilistic survey conducted in Mexico in 1999, 17.7% of children <5 y old were stunted (height-for-age < ±2 SD). However, linear growth stunting associated with poor nutrition was clearly a problem of the poor: the prevalence of the stunting in the lowest socioeconomic decile (47.6%) was 10 times higher than in the top decile.(5) Even though improvements have occurred in recent years, undernutrition continues to be an important public health problem among the poor in Mexico.(6)

In 1997, the Mexican federal government launched PROGRESA (Program for Education, Health and Nutrition; now called *Oportunidades*), a large-scale poverty alleviation program. *Oportunidades* provides conditional cash transfers and includes a strong nutrition component. The program began operating on a small scale in rural areas and was expanded to urban areas in 2002. It has now enrolled its target population size: 5 million households in all regions of the country. The program has been shown to be associated with better growth and a reduced prevalence of anemia in infants in rural areas.(7) In this article, we

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5 Abbreviations used: HAZ, height-for-age Z-score; WHZ, weight-for-height Z-score; SES, socioeconomic status.

report the impact of *Oportunidades* on child growth in urban Mexico. Documenting the program's impact in urban areas is important because living conditions in urban vs. rural settings differ greatly in Mexico. As a consequence, the socioeconomic and environmental determinants of growth retardation are different [see for instance Menon et al. [8]]. Additionally, the prevalence of stunting is lower in urban than in rural Mexico.[5,6] A program that effectively improves child growth in rural areas may not necessarily have a similar impact in urban areas. Evaluating the impact of *Oportunidades* in urban areas is thus essential to estimate the potential impact of the program on child growth in the Mexican population.

Methods

The Oportunidades program and its evaluation. The primary goal of *Oportunidades* is to increase human capital through the simultaneous investment in health, education, and nutrition. This is based on the premise that different dimensions of human welfare are interdependent and that poor health, education, and nutrition are both causes and consequences of poverty.[9]

Through the program, beneficiary families receive a monthly cash transfer intended to improve their food purchasing power. The program also provides milk-based micronutrient fortified foods targeted to children 6±23 mo of age, to children 2±4 y of age with low weight (weight-for-age < ±1 SD), and to pregnant and lactating women. The food which is prepared as a porridge provides the daily recommended dietary allowance of zinc, iron, and a number of essential vitamins and ~20% of the energy needs for children <2 y of age. The program's health component includes the provision of a number of obligatory preventive and primary curative health services. These include immunization of children, growth monitoring for children 0±60 mo of age, and prenatal and postpartum care visits, among others. Household members 15 y and older (depending on theme to be discussed) attend monthly meetings at which health, hygiene, and nutrition issues are discussed. Program benefits are conditional on regular attendance at all services appropriate for household demographics. Households are disenrolled when they have missed 3 consecutive health visits or health education sessions. Additionally, scholarships, prorated for male vs. female students (higher for female) and grade level, are provided, conditional on enrollment and regular attendance at school. The female heads of household receive all program benefits, recognizing the potential of women to use the resources effectively and efficiently to cover the needs of the family. Typically, households receive the equivalent of 32.5 to 41.3 US dollars, constituting 19 to 24% of mean household consumption. Households remain in the program for 3 y, after which program eligibility is reevaluated.[9±13]

The program employs a 2-stage approach to enroll households in urban areas (50,000 to 1 million inhabitants) into the program. *Oportunidades* was first targeted to urban centers with a high density of low-income households. The cutoff for eligibility was based on a discriminant analysis of the 2000 National Household Income and Expenditure Survey. The discriminant analysis was based on socioeconomic characteristics [see Coady and Parker [14] for details]. The estimated cutoffs were then applied to the 2000 national census to identify the poorest urban blocks. Within each block, the poorest households were targeted.

Mass media were used to advertise the program and invite families to solicit a socioeconomic screening questionnaire at the enrollment centers. The assessment utilized household assets, housing quality, years of education, and household composition. Program staff visited all households that appeared eligible to validate the results of the screening questionnaire. Eligible applicants subsequently had to return to the program office to register in the program. Household enrollment in urban areas started in 2002 and was staged over 2 y.

One of the unique aspects of *Oportunidades* is the inclusion of impact evaluation within the program mandate. The National Institute of Public Health conducted the baseline survey from September to December 2002 and the follow-up survey from July to November 2004. For the evaluation sample, 149 *manzanas* (the smallest administrative unit within an urban area) in 17 of Mexico's 31 states were selected through probabilistic stratified sampling from the pool of localities where *Oportunidades* would be implemented in 2002. The survey included eligible households that enrolled and eligible households that did not enroll in the program. Program enrollment was positively associated to the potential cash transfer households could receive but not to having a child eligible to receive the nutrition supplement.[15] No households had actually begun to receive benefits at the time of the baseline survey.

Data collection. Both at baseline and follow-up, child and maternal anthropometric data were collected, as were socioeconomic data. In 2002 anthropometric measurements were obtained for children younger than 4 y old

and their mothers. In 2004 follow-up anthropometry was obtained for all children 2 to 4 y of age (i.e., <24 mo of age in 2002) and their mothers. Weight and recumbent length (in children <24 mo) or standing height (24- to 48-mo-old children and mothers) were measured using standard anthropometric methods(16) by highly trained and standardized anthropometrists.(17) Weight was measured to the nearest 20 g with an electronic scale (Tanita Mother-Baby scale, model 1582, Tanita Corp.), and length or height was measured to the nearest mm with a portable infantometer/stadiometer (Schorr Industries). Anthropometric Z-scores were calculated using the new WHO growth reference standards.(18). The socioeconomic data included, among other things, sociodemographic characteristics, educational level, employment, housing characteristics, and common domestic goods. Data were collected by means of fieldworker-administered surveys. Fieldworkers were extensively trained.

The survey included eligible households that enrolled and eligible households that did not enroll in the program. Program enrollment was related to both household and program characteristics.[14] Households were considered to be enrolled in the program if both the self-report and the administrative record identified the household as such. Likewise, comparison households were those who were listed as not enrolled in the program according to administrative records and self-report. Approximately three-quarters of all households (73.4%) were consistently classified as either intervention or comparison households.

In each household, written informed consent for participation was obtained from the mother or the self-identified decision maker. The protocols governing the data collection were approved by the Research, Biosafety and Ethics Commissions of the National Institute of Public Health in Mexico.

Data analysis. The baseline characteristics of the children in the intervention and comparison households were compared using the Student's t test for means of the symmetrically distributed variables, the chi square test for proportions, and the Wilcoxon-Mann-Whitney test for the distribution of skewed variables. The impact of *Oportunidades* on child linear growth was assessed using the change in the child's absolute length (in cm) and height-for-age Z-score (HAZ)5 from baseline to follow-up. To evaluate the impact on weight gain, we used the difference in absolute weight (in kg) and in weight-for-height Z-score (WHZ). The socioeconomic status (SES) of each household was estimated using the program's summary variable of eligibility from the 2002 data. It is important to note that all households in the sample were within the poorest 20th percentile of the Mexican population. The tertile classification used in this analysis provided a relative measure of socioeconomic well-being of each household compared with the other households in the sample, without reference to the broader society.

We estimated the impact of the program using difference-in-difference propensity score matching. This statistical procedure compares the change over time in the outcome for the intervention households with the change over time in matched comparison households. This method controls for the household's self-selection into the program, i.e., for systematic differences between households that may be related to the outcome.[19] We matched comparable households in the intervention and comparison groups. Rather than matching on all relevant socioeconomic characteristics (which is technically very challenging with a high number of covariates), matching was based on the household's propensity score. This score is the household's estimated probability of enrollment in the program given a number of relevant observed characteristics. We estimated the propensity score using a logit model, including such socioeconomic variables as housing characteristics, household assets, household composition, schooling, employment status, and income. To evaluate whether the matching procedure rendered the observable differences between intervention and comparison households insignificant, we checked the "balancing" of all variables used to estimate the propensity score. The balancing tests showed that there were no statistically significant differences between the matched intervention and comparison households.[20]

In addition to the propensity to enroll in *Oportunidades*, we matched children in intervention and comparison households on characteristics strongly associated with growth, specifically maternal height, child sex and age, and child length or weight at baseline. The matching estimator was implemented using Abadie and Imbens' [21] method, which is available as part of the Stata package (StataCorp, version 8.2). This procedure allows households to be used as a match more than once. Each intervention child was matched to 5 comparison children. No households were excluded in the matching procedure. The bias arising from inexact matches was corrected by means of Abadie and Imbens' bias correction procedure. The method uses a Z-test to determine statistical significance.

The association between program participation and child growth was estimated for all children younger than

24 mo of age at baseline and then stratified by age group (children younger than 6 mo, between 6 and 12 mo, and between 12 and 24 mo) and by socioeconomic tertile. We conducted the analysis based on an a priori hypothesis that the program has a greater potential to impact child growth when implemented at a young age [21] and on previous evidence of age and SES-specific impacts of the same program in rural areas.[7,22] The program's expected positive impact on child growth provided a clear a priori direction for hypothesis testing. Given the hypothesis that growth would improve as a consequence of the program, statistical theory dictated the use of 1-sided tests.[23] Thus 1-sided tests were reported. Although we based our conclusions on the 1-sided tests, 2-sided tests were also conducted. P-values < 0.05 were considered statistically significant.

Results

A total of 733 households were consistently classified as living in intervention or comparison households (Fig. 1). Of the 574 children in intervention households, 202 were lost in the follow-up. An additional 28 children were excluded from the analysis because of missing data. In the comparison group, 61 of the 159 children were lost in the follow-up and 10 children were excluded because of missing data. Data on the reasons for loss to follow-up was only available for a subset of missing households (91 out of 263). For almost all households, the reason for loss to follow-up was that they moved to another place. Full data were thus available for a panel of 432 children who were younger than 24 mo in 2002, 344 of whom lived in intervention households and 88 in comparison households.

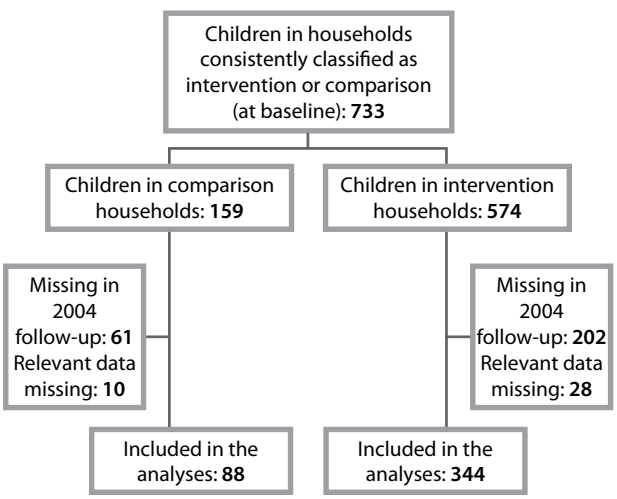

Figure 1. Sample sizes for the evaluation sample and reasons for noninclusion in the analysis.

At baseline, the mean child age was 12 mo with little over half of the children being female (Table 1). Mean HAZ was ±1.32 SD, corresponding to a prevalence of stunting (HAZ < ±2 SD) of 31%. Mean WHZ was slightly >0, and <1.5% of the children in this population were classified as wasted (WHZ < ±2 SD). The mothers' mean height was 1.5 m, and >60% of the heads of households had completed primary education. The median number of rooms in the house was equal to 1. The median reported income for the head of the household and his or her spouse was 1566 Mexican pesos (equivalent to 143 US dollars). These characteristics did not differ between treatment and comparison households. However, as would be expected, the propensity score was substantially higher in intervention households.

Table 1. Baseline characteristics of the children belonging to the comparison and intervention groups[1]

Characteristic	Comparison group	Intervention group
n	88	344
Child[2]		
Age, mo	12.4 ± 6.9	12.6 ± 6.7
Sex, % female	52	50
HAZ	−1.40 ± 1.16	−1.29 ± 1.36
Length, cm	70.2 ± 8.7	70.9 ± 8.5
WHZ	0.33 ± 1.00	0.30 ± 1.07
Weight, kg	8.46 ± 2.08	8.62 ± 2.05
Mother[2]		
Height, cm	149.0 ± 5.5	149.1 ± 5.6
Household[3]		
Head of household completed primaria, %	64	60
Total rooms, n	1.0 ± 0.7	1.0 ± 0.7
Total reported income, Mexican Pesos[4]	1708.33 ± 2934.36	1540 ± 2011.41
Propensity score	0.69 ± 0.22	0.88 ± 0.14*

[1] n may differ slightly from variable to variable because of missing values
[2] Values are means ± SD or percent
[3] Values are medians ± SD or percent
[4] Head of household and spouse
* Different from comparison households, P < 0.05

There was no significant association between program participation and growth in the entire sample of children <24 mo of age at baseline (Table 2). In children younger than 6 mo in 2002, program participation was associated with a 1.53-cm (P = 0.015) greater length gain or 0.41 Z-scores (P = 0.035). In children 6 to 12 mo of age at baseline, the direction of the relationship was similar (0.73 cm or 0.23 Z-scores) but results were not statistically significant (P = 0.13 and P = 0.11, respectively). An association between program participation and linear growth was found for the poorest households only, although this did not reach statistical significance (0.05 < P < 0.10) (Table 3). In the lowest SES tertile of the sample, children in intervention households grew 0.86 cm (P = 0.095) or 0.27 Z-scores (P = 0.070) more than children in comparison households. This effect was not due to differences in the age composition of the 3 tertiles because no age differences were found (analyses not shown).

There was a tendency toward higher weight gain in children from intervention than from comparison households (Table 2), but this association was again limited to the children younger than 6 mo in 2002 who gained an additional 763 g (P = 0.007), corresponding to 0.47 Z-scores (P = 0.016). In the lowest socioeconomic tertile, children in intervention households gained 523 g (P = 0.027) more than comparison children (Table 3). No association between program participation and WHZ was found within specific SES tertiles.

None of the conclusions with respect to statistical significance changed when double-sided tests were used, apart from HAZ in children younger than 6 mo in 2002 (P = 0.07).

Table 2. Impact of the *Oportunidades* program on child linear growth and weight gain by childage at baseline

Characteristic	Estimated impact [1]	P- value
Height, cm		
All Children	0.47 ± 0.38	0.108
0-6 mo	1.53 ± 0.70	0.015
6-12 mo	0.73 ± 0.66	0.135
12-24 mo	0.07 ± 0.53	0.903
HAZ		
All Children	0.11 ± 0.10	0.130
0-6 mo	0.41 ± 0.22	0.035
6-12 mo	0.23 ± 0.18	0.108
12-24 mo	0.02 ± 0.13	0.456
Weight, kg		
All Children	0.202 ± 0.158	0.102
0-6 mo	0.763 ± 0.310	0.007
6-12 mo	0.026 ± 0.410	0.475
12-24 mo	0.09 ± 0.172	0.299
WHZ		
All Children	0.085 ± 0.101	0.200
0-6 mo	0.465 ± 0.216	0.016
6-12 mo	0.172 ± 0.239	0.236
12-24 mo	0.103 ± 0.121	0.198

[1] Values are means ± SE. The impact was estimated by matching intervention and comparison observations on propensity score, maternal height, child age at baseline, baseline length/HAZ, and child sex. Results were bias corrected.

Table 3. Impact of the *Oportunidades* program on child linear growth and weight gain by household socioeconomic tertile at baseline

Characteristic	Estimated impact[1]	P-value
Height, cm		
Tertile 1	0.86 ± 0.66	0.095
Tertile 2	0.22 ± 0.60	0.356
Tertile 3	0.74 ± 0.61	0.113
HAZ		
Tertile 1	0.27 ± 0.18	0.070
Tertile 2	0.00 ± 0.18	0.493
Tertile 3	0.13 ± 0.15	0.195
Weight, kg		
Tertile 1	0.523 ± 0.272	0.027
Tertile 2	0.079 ± 0.235	0.368
Tertile 3	0.138 ± 0.282	0.313
WHZ		
Tertile 1	0.118 ± 0.202	0.279
Tertile 2	0.074 ± 0.151	0.313
Tertile 3	−0.164 ± 0.170	0.167

[1] Values are means ± SE. The impact was estimated by matching intervention and comparison observations on propensity score, maternal height, child age at baseline, baseline length/HAZ, and child sex. Results were bias corrected.

Discussion

Our analyses show that the *Oportunidades* program effectively improves growth of children in urban areas of Mexico. The impact of the program was limited to children <6 mo of age at baseline, consistent with previous evidence that interventions to improve growth are more efficacious when implemented in younger children.[22] Children in this age group had the longest exposure to the program benefits during this critical period. The estimated effect in children younger than 6 mo represents the impact the program is expected to have on growth in the general *Oportunidades* population. The program has now enrolled its entire target population (5 million beneficiary families) so that all children should be receiving benefits from early on.

Interestingly, the magnitude of the impact of *Oportunidades* in urban areas was relatively similar to that in rural areas. In rural Mexico, a significant impact of the program was found on child growth in children younger than 6 mo at baseline living in the poorest households.[7] Unfortunately, the urban study did not have the statistical power to test for an interaction between age and SES. The smaller effect size reported in rural areas (1.1 cm vs. 1.5 cm after 2 y) was most likely due to an underestimation of the true impact. In rural areas, children in the comparison group had received the program for at least 1 y when the impact on growth was assessed, because the comparison group was included in the program 1 y earlier than planned. The early inclusion may further have masked a program impact in children 6 to 12 mo of age in rural areas.

A part of the effect of the program on absolute weight gain of children 0 to 6 mo of age is due to improved linear growth. The impact on child WHZ, however, shows that these infants in the intervention households are gaining weight beyond what can be accounted for by linear growth. This is especially worrisome as there is no indication that children in this sample were wasted at baseline (mean WHZ at baseline +0.31). To our knowledge, there is no clear evidence that greater weight gain of the magnitude reported here at this young age is directly related to excess weight in later childhood. Nonetheless, given the increasing problem of overweight in Mexican children, further studies are currently under way to determine the impact of the program on dietary patterns of small children and also whether regular consumption of the fortified food supplement according to program guidelines may lead to excess weight gain.

In the past, it was shown that the systems for the delivery of health services and program benefits in developing countries were often deficient. Additionally, service and program utilization was found to be inadequate in the poorest of the poor.[24,25] Although all *Oportunidades* beneficiaries were poor compared with the entire Mexican population, there was still a broad socioeconomic variation within the sample. The large program impact in the poorest households shown in this analysis suggests that these barriers to participation by the poorest beneficiaries may not exist in the *Oportunidades* program, at least not among the young children where growth outcomes were assessed. This may be related to the conditional nature of program participation in *Oportunidades*. The requirements imposed related to the use of preventive health services may encourage the poorest families to overcome barriers that have limited program participation in the past. Future evaluations of *Oportunidades* should attempt to document whether this is the case.

A potential limitation of this study is that the comparison group for this study consisted of eligible households that did not enroll in the *Oportunidades* program but lived in the same communities as the enrolled households. The selection of households could thus have biased the results if enrollment was related to unobserved characteristics that simultaneously determined child growth, such as maternal attitudes and behavior. We studied the mean attained height at baseline of children over 2 y of age. At baseline, differences in height between children in the intervention and comparison households can be attributable to individual nutrition and health factors that influence growth, but not to the *Oportunidades* program. We compared mean attained height at baseline of children 24 to 48 mo of age and found no significant difference between children from households who enrolled in the program and those who did not (our comparison group). We conclude that it is very unlikely that our findings suffer from selection bias related to factors that predict both child growth and program participation.

Another possible source of selection bias is the loss to follow-up. No differences were found, however, in any of the baseline characteristics between children lost to follow-up and children included in the analysis. Additionally, loss to follow-up was similar in both intervention and comparison groups. To avoid error due to misclassification of status of incorporation in the program, we used only those children for whom self-report and program records agreed. To evaluate possible selection bias, we compared children excluded because of inconsistent

program classification and children included in the analyses on all baseline characteristics and SES. The only statistically significant difference was a lower weight (259 g) in the excluded group, but this difference disappeared when comparing baseline WHZ. HAZ was marginally lower in the excluded children. We do not believe that the exclusion of observations caused any bias in the results.

The use of longitudinal data are an important strength of this study. The difference-in-difference approach we used controls for the effects of unobserved time-invariant differences between children in intervention and comparison households. Propensity score matching was used to control for the potentially confounding effects of variables associated with self-selection into the program. A key advantage of this method (as compared with regression models) is that no assumptions are made about the functional form of the association between confounders and the outcome variable.[26] Additionally, the balancing of the variables used to estimate the propensity score ensures that the matched intervention and comparison children, apart from their participation in the program, were comparable on all observable variables.[20] One can never completely exclude the possibility that statistical findings are due to chance. We believe, however, that this is unlikely in our study, given the evaluation design, the analytical approach, and the consistency of our findings with those in rural Mexico and with the literature on child growth.

At this time, we do not know which component or components of the program are most likely responsible for the impact on child linear growth. The growth monitoring and health and nutrition education components of the program are obligatory and hence compliance has been well above 90%.[15] The impact of the program on child linear growth may be the result of micronutrient (particularly zinc) intake from the fortified food supplement. We have reported previously, however, that consumption of the fortified food is far below desirable in beneficiary children 6±23 mo of age.[15] Child growth may also have benefited from improvements in the quality of the home diet or may be related to improved health care, which possibly reduced the frequency and/or severity of infectious disease. We therefore believe that the impact on linear growth is likely due to a combination of influences and not specifically attributable to the fortified food alone.

With respect to the impact on weight gain, preliminary analysis of dietary intake suggests that in those who consumed the fortified food supplement regularly, micronutrient but not energy intake was considerably higher than in those who did not consume the food.[27] Preliminary analyses suggest that this pattern does not differ by age group. The income transfer from the program may have resulted in higher energy intake from the home diet in young children. Studies are underway to further explore these pathways.

Although the urgent need for effectiveness evaluations of large-scale health and nutrition programs has been identified,[28,29] few such studies have been reported in scientific literature. The randomized design used for the impact evaluation in rural areas was abandoned in urban areas for political reasons. Communities with the highest density of poor households were enrolled first. The use of quasi-experimental methods with appropriate matching techniques still allowed for a rigorous impact evaluation design.

Conditional cash transfer programs have now been implemented in many countries in the region, including Nicaragua, El Salvador, Brazil, Honduras, among others. Although many have begun or are planning evaluations, little has been published to date on their impact. In Nicaragua participation in the Red de Protección Social improved HAZ by 0.17 SD in children under 5 y of age.[27] The Honduran Programa de Asignación Familiar did not have any impact on child growth, but this may be explained by the relatively small transfer and very low coverage of the program in eligible communities.[28,29] Little is known about the impact of these programs on the nutritional status of children in poor urban households. This study shows that *Oportunidades*, a conditional cash transfer program with a strong nutrition component, effectively improves growth of poor children in urban areas of Mexico. The documentation of the program's impact is extremely important to providing evidence that the program is meeting its objectives in relation to improving child nutritional status and to justifying its continuation and expansion. The results reported here reemphasize the importance of designing public health interventions with a built-in evaluation component.

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Evaluación inicial del Seguro Popular sobre el gasto catastrófico en salud en México*

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Para el año 2004 el gasto total en salud como porcentaje del Producto Interno Bruto (PIB) en México fue de 5,8 %. De éste, 53,6 % fue gasto privado, que en 94 % provino del gasto de bolsillo de los hogares. Para el período 1992-2002 se estimó que para 3 a 4 % de los hogares mexicanos este gasto fue de carácter catastrófico,[1] entendiendo por éste una proporción mayor o igual a 30 % del consumo disponible del hogar, que se define como el consumo total menos el consumo en alimentos.[2]

El gasto catastrófico en salud (GC) tiene una mayor incidencia en los hogares más pobres, especialmente entre los que no tienen ningún aseguramiento en salud, quienes llegan a destinar en promedio 10 % de su consumo disponible.[3] En el año 2004, 1,8 % de los hogares se empobrecieron por incurrir en un gasto en salud, es decir, que cruzaron la línea de pobreza o cayeron más abajo de ésta; de este porcentaje casi la totalidad pertenecía al quintil de ingreso más pobre. Entonces si se considera para ese mismo año, el porcentaje de hogares que incurrieron en GC o en gasto empobrecedor o en ambos, denominados gastos excesivos, estos representaron 4,1 %. Este tipo de gasto afectó al 9,7 % de la población del primer quintil.[4,5] El 60% de este GC en los hogares pobres se efectúa en atención ambulatoria y medicamentos.[1]

También se ha documentado que gastan más los hogares que: a) residen en zona rural; b) cuentan con personas mayores de 60 años de edad o niños; c) en donde el jefe del hogar es una mujer, cuando éste sobrepasa los 60 años de edad o cuando tiene bajo nivel educativo; d) cuentan con un miembro discapacitado, y e) enfrentan un parto.[1,6,7]

Tener que incurrir en gasto de bolsillo se convierte en una barrera para el acceso y la utilización de los servicios de salud. Así, se ha estimado que 20% de la población mexicana tiene dificultades para pagar la atención y 25 % la pospone por este motivo, esto es más frecuente entre los más pobres, los ancianos y quienes habitan en zona rural.[8]

Los gastos de bolsillo y catastrófico reflejan, en parte, la falta de una adecuada garantía al acceso a los servicios de salud. Al respecto, algunos países han puesto en marcha distintas reformas a sus esquemas de financiamiento mediante esquemas de aseguramiento en salud, con la introducción del prepago como mecanismo para agrupar los riesgos financieros a los que puede conducir la demanda por servicios de salud, y en donde se focalizan subsidios para los más pobres, con el fin de eliminar las barreras económicas en el acceso a los servicios, aumentar la cobertura, disminuir el gasto de bolsillo, lo cual se conoce en su conjunto como protección financiera en salud.[9]

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Como parte de este esquema, México creó el Sistema de Protección Social en Salud (SPSS) con la reforma a la Ley General de Salud que entró en vigencia en el año 2004 con la operación del Seguro Popular de Salud (SPS), pero comenzó como un proyecto piloto en el año 2001 en cinco estados de la República: Aguascalientes, Colima, Campeche, Jalisco y Tabasco. Este es un seguro público de carácter voluntario dirigido a familias sin acceso a otros sistemas de seguridad social independientemente de su nivel socioeconómico. Este seguro ofrece un paquete de servicios definido a través de el Catálogo Universal de Servicios de Salud (CAUSES). El financiamiento es tripartito, proveniente de los recursos federales y estatales como un subsidio a la demanda, así como de los aportes anticipados de la población, según su nivel de ingreso, de las que están exentos los dos primeros deciles.[10]

Con este nuevo esquema se pretende dar cobertura a la totalidad de la población sin acceso a la seguridad social para el año 2010, y reducir en 75% el gasto catastrófico de la población a la que va dirigido el seguro.[10] Hasta el año 2006 el SPS había alcanzado una cobertura de 5,1 millones de familias, lo que representa 43 % de la población objetivo.[11]

Para el año 2005, en el estado de Colima se había alcanzado 100 % de la afiliación de la población de los primeros dos deciles. En este estado desde el inicio de este programa se implantó la cuota cero para los hogares de los dos primeros deciles, se amplió el paquete de beneficios de 78 a 110 acciones en salud y de 165 a 221 medicamentos.[12] Es importante señalar que éste fue uno de los estados de la Federación con gasto catastrófico más bajo, (2,2 % de los hogares) para el año 2002.[1] Por su parte, en Campeche para este mismo período 2,5 % de los hogares incurrieron en gasto catastrófico y hasta el primer trimestre del año 2005 se había afiliado al SPS al 40 % de la población objetivo.[1,12]

Dado que hay poca información publicada sobre el monitoreo del resultado que ha tenido la introducción del SPS en la reducción del gasto de bolsillo y catastrófico, este trabajo tiene como objetivo estimar el resultado inicial del SPS sobre el gasto catastrófico en salud en hogares afiliados en los estados de Colima y Campeche en el tercer trimestre del año 2002. Adicionalmente, se estima el efecto de otros factores de importancia asociados al gasto catastrófico en salud entre hogares afiliados y no afiliados al SPS en estos estados.

Marco conceptual

Se conoce como gasto de bolsillo en salud al total de las erogaciones que los hogares hacen para poder recibir la atención. Estas erogaciones incluyen tanto los gastos directamente relacionados con la atención, como aquellos que son necesarios para acceder a ésta.[2]

En el análisis de la carga financiera que estas contribuciones representan para los hogares han sido planteados dos enfoques que pudieran ser complementarios. El primero define un gasto en salud como catastrófico cuando éste sobrepasa una proporción definida del ingreso o consumo disponibles del hogar, para lo cual se han utilizado diversos puntos de corte; éstos van desde 20 a 40%, las limitaciones de este enfoque se mencionarán en la discusión.[9,13,14]

El segundo enfoque define un gasto en salud como empobrecedor cuando este desplaza a un hogar por debajo de la línea de pobreza (LP), o bien, profundiza su pobreza si es que ya se encontraba por debajo de esta línea. Este enfoque toma en cuenta cualquier monto de gasto en salud que hace que se empobrezcan los hogares independientemente de si sobrepasa o no la definición de GC.[15] El problema de este enfoque radica en la medición misma de lo que es pobreza y, por lo tanto, en qué nivel ubicar la línea de pobreza.[16]

Tomando en cuenta que uno de los objetivos principales del SPS es la reducción del gasto catastrófico en salud, en este estudio nos centraremos en su análisis. Consideramos que los hogares pueden incurrir en gasto en salud una vez que han cubierto un mínimo de necesidades básicas de subsistencia, que para este estudio se consideró como cubrir los gastos de alimentación.

Material y métodos

Este estudio se basa en un análisis secundario y transversal de la Encuesta de Evaluación del Seguro Popular (EESP), llevada a cabo en los estados de Colima y Campeche en septiembre del año 2002 por el Grupo de Evaluación Externa del SPS, conformado por el Instituto Nacional de Salud Pública de México y FUNSALUD, con el fin de evaluar la fase piloto.

Para la EESP se seleccionaron 1 120 hogares afiliados al SPS mediante un muestreo aleatorio simple de los listados de hogares que fueron incluidos en la evaluación inicial o basal realizada tres meses antes en los estados de Colima y Campeche. Se consideraron como casos a los hogares que en la medición basal de la evaluación, se identificaron como afiliados al SPS. El grupo control se conformó por dos hogares por cada caso entre los hogares que en la medición basal reportaron no contar con seguridad social y que al momento de la segunda evaluación

(la realizada para estudio) no presentaron cambios en su calidad de afiliación a la seguridad social y que además residieran en el mismo barrio del control, lo que dio un total de 2 232 hogares no afiliados. Asimismo, el cálculo de la muestra se hizo considerando que un 10 % de estos hogares incurrían en GC, dado que era población sin seguridad social y ubicada en los menores deciles de ingreso.

La submuestra para este estudio quedó conformada por aquellos hogares que contaban con mínimo tres meses de afiliación al SPS previos al levantamiento de la encuesta de evaluación, así como todos los hogares sin afiliación a la seguridad social. Otros criterios de inclusión fueron el de incorporar solamente aquellos hogares que reportaron haber tenido al menos un integrante con algún problema de salud, embarazo, que requirió atención de parto, o bien, que utilizó servicios preventivos en los últimos tres meses. Así, la submuestra para este estudio estuvo conformada por 2 158 hogares, de los cuales 482 estaban afiliados al SPS y 1 676 no contaron con ninguna afiliación. La unidad de análisis del estudio fue el hogar, definido como el número de personas que comparten un mismo gasto alimentario.

En este estudio se definió como gasto de bolsillo en salud a cualquier desembolso realizado al momento de recibir servicios de salud tanto formales como no formales. El gasto catastrófico (GC) se definió como una variable en forma dicotómica, y se consideró cuando un hogar destinó 30 % del consumo disponible a la atención a la salud, o para acceder a ésta, lo que es congruente con lo que se recomienda para los países de ingreso medio como México.[1,3] Este gasto se calculó de forma trimestral acorde con la temporalidad cuando la encuesta fue levantada. El consumo disponible se estimó como el consumo o gasto total reportado por el hogar, menos el gasto en alimentos, excluyendo de este último el gasto en bebidas alcohólicas o alimentos fuera del hogar.[2].

Las variables independientes para predecir GC se agruparon en cinco categorías de factores:

1. Condición de afiliación del jefe o cónyuge al SPS;
2. Entidad federativa de residencia (Colima o Campeche);
3. Características y composición del hogar (características del jefe del hogar: edad, actividad laboral), tamaño del hogar e índice de dependencia (cociente de la suma de integrantes del hogar menores de 5 y mayores de 60 años de edad entre el total de personas en el hogar);
4. Estatus económico del hogar (número de perceptores de ingresos, consumo disponible trimestral per cápita-CDPC);
5. Necesidad de atención en salud del hogar (tipo de problema de salud ambulatorio en los últimos tres meses, grado de severidad auto-percibida, tipo de servicio de salud utilizado, institución en la que se utilizó el servicio, presencia de enfermos crónicos, y presencia de discapacitados).[19]

Para caracterizar a la población del estudio y comparar el gasto de bolsillo y catastrófico por rubros se realizó inicialmente un análisis univariado con medidas de tendencia central y se probó la normalidad de las variables. El análisis bivariado se realizó con pruebas de *ji* cuadrada, para comparación de proporciones, y pruebas de Mann-Whitney, para comparación de rangos de las variables con distribución no normal.

Construcción del modelo multivariado

En este trabajo se probaron dos modelos para estimar el resultado inicial del SPS sobre el gasto catastrófico de los hogares. El primero fue un modelo *probit* en el que se incluyeron las variables que en el análisis bivariado tuvieron un valor de p<0,025, o bien, aquellas que por su relevancia teórica deberían incluirse en el modelo. El segundo fue un modelo *probit bivariado*, el cual permite probar la existencia o no de un sesgo de selección del SPS y corregirlo en caso de existir.[17] En términos econométricos el sesgo de selección es equivalente a la existencia de endogeneidad entre la variable de afiliación al SPS y el GC, de forma que pueden existir una serie de factores no observables, no medibles o no incluidos de manera explícita en el modelo que influyen al mismo tiempo sobre afiliación al SPS y sobre el GC, en presencia de la cual se obtiene una estimación sesgada de la asociación entre SPS y GC si ésta no se toma en cuenta.

Como prueba de la existencia o no de endogeneidad, y poder elegir así entre un modelo *probit* y un *probit bivariado* se estimó la correlación de los términos de error de las dos ecuaciones estimadas de forma simultánea en el modelo *probit bivariado*: la de GC y la de afiliación al SPSy como prueba adicional la diferencia en el signo para el coeficiente de la variable de afiliación al SPS entre los dos modelos. En la identificación de variables instrumentales (Z) para explicar la variable endógena de afiliación al SPS y que no deben estar relacionadas con el GC, se usó el método de la razón de verosimilitud, mediante una prueba ji cuadrada aplicada a los dos modelos estimados para predecir GC, en uno de los cuales se incluyeron las variables Z (18). Después de probar varios conjuntos de variables

identificadoras, se encontró al sexo, nivel de escolaridad del jefe del hogar, así como la presencia de alguna embarazada entre las integrantes del hogar, como un conjunto adecuado de variables Z.

Finalmente, a partir del modelo *probit bivariado* se realizaron simulaciones discriminando por afiliación al SPS y por tercil de CDPC, con el fin de estimar la probabilidad de GC variando la entidad federativa y si un hogar sólo utilizará un tipo de servicios. El análisis se llevó a cabo con el paquete estadístico Stata 8.2.

Resultados

Los hogares afiliados al SPS tuvieron en promedio un menor nivel de escolaridad del jefe y de consumo disponible per cápita en relación con los hogares no afiliados (Tabla 1). Asimismo, se encontró que los hogares afiliados tuvieron significativamente una mayor proporción de embarazadas y de utilización para todos los tipos de servicios de salud, especialmente para la atención del parto, excepto para los servicios preventivos del niño; esta utilización se realizó principalmente en el sector público (Tabla 2).

El gasto en servicios ambulatorios y preventivos representó la mayor proporción del CDPC y ésta fue significativamente mayor en los hogares afiliados (10,8), en comparación con los no afiliados (3,6). En contraste, el gasto en hospitalización fue significativamente mayor para los hogares no afiliados (16,2) que para los afiliados (0) y representó, en promedio, la mayor proporción del CDPC. Pese a estas diferencias, al analizar las medianas del gasto de bolsillo total per cápita no se encontraron diferencias estadísticamente significativas entre ambos tipos de hogares. El porcentaje de hogares que incurrieron en GC fue de 27 % entre los hogares no afiliados y de 20 % entre los hogares afiliados al SPS, aunque esta diferencia no fue significativa.

Para la estimación de ambos modelos se introdujo el CDPC por tercil por no cumplir con el supuesto de linealidad en su forma continua, y la edad del jefe del hogar de forma cuadrática para captar el efecto no lineal. Se mantuvieron en los modelos la interacción entre la presencia de enfermos crónicos y la utilización de servicios de hospitalización por resultar significativa.

Con el modelo *probit* se obtuvo una estimación de signo positivo entre afiliación al SPS y GC (1,6 %) lo que resultaría contraintuitivo si no fuera por la existencia de endogenoeidad, ya que esto significaría que estar afiliado al SPS se asocia con una mayor posibilidad de incurrir en GC (Tabla 3). Este conjunto de evidencias, nos conduce

Tabla 1. Características sociodemográficas de los hogares de la Encuesta de Evaluación del Seguro Popular, en los estados de Colima y Campeche, México, 2002.

Variables	% Hogares no afiliados N=1676	% Hogares afiliados N=482	P
Estado			
Colima	75,5	64,3	
Campeche	24,5	35,6	
#Personas en el hogar			
1-2	16,4	14,7	
3-4	43,7	43,1	0,71†
5-6	27,6	28,6	
7-13	12,1	13,4	
Índice de dependencia	0,2	0,2	0,72*
Genero jefe hogar			
Hombre	79,3	76,9	0.25†
Mujer	20,6	23,0	
Edad jefe hogar			
17-40	49,8	45,4	
41-60	35,8	38,1	0,20†
61 y mas	14,3	16,3	
Nivel de escolaridad jefe hogar*			
Ninguno	13,8	13,5	
Primaria	51	60,9	
Secundaria	21,3	18,3	0,00†
Preparatoria o mas	13,8	7,2	
Actividad laboral jefe hogar			
Desempleado	4	3,3	
Trabajador	79,9	72,8	
No trabaja/estudiante	9,5	12,2	0,16†
Pensionado/incapacitado	1,5	2,4	
Hogar	7,9	9,1	
Perceptores de ingresos	1	1	0,18*
Consumo de disponible per capita x tercil*			
I:4-399.352	28,8	35,8	
II:399.353-1034.76	32,7	35,4	0,00†
III:1074.77-1503765	38,4	28,6	

*Variable significativa $p < 0.05$ † X2 U Mann-Whitney

Tabla 2. Características de necesidad y utilización de los hogares de la Encuesta de Evaluación del Seguro Popular, en los estados de Colima y Campeche México, 2002

Factores de necesidad y Utilización	% Hogares no Afiliados	% Hogares afiliados	P
Problemas de salud ambulatorio			
Ninguno	42,6	40,8	
Agudo	31,8	30,9	0,64†
Crónico	2	2,7	
Otras y combinación	23,4	25,5	
Severidad problemas ambulatorio	N = 961	N = 285	
Leve	37,7	36,4	
Moderado	29,2	25,9	0,32†
Severo y combinación	32,9	37,5	
Embarazo*			
No	93,7	90,4	0,01†
Si	6,3	9,5	
Motivo de hospitalización	N = 72	N = 36	
Cirugía	82,1	77,7	
Otras	16,4	19,4	0,80†
Cirugía y otras	1,3	2,7	
Personas discapacitadas			
No	90,5	89	0,32†
Si	9,4	11	
Enfermos crónicos			
No	53,3	52,9	0,86†
Si	46,6	47,1	

Factores de necesidad y Utilización	% Hogares no Afiliados	% Hogares afiliados	P
Utilización preventiva*	N = 1676	N = 482	
Ninguna	50,1	39,4	
Niño	17	15,7	
Reproductiva	9,9	14,1	0,00†
Detención crónica	5,6	6,8	
Otras u combinación	17,1	23,8	
Utilización ambulatorio (# personas)	N = 1676	N = 482	
0	19,9	14	
1	67,4	71,5	0,06†
2 – 10	12,3	14,3	
Utilización control prenatal*	N = 105	N = 46	
No	15,2	4,3	0,05†
Si	84,7	95,6	
Utilización atención parto*			
No	76,1	41,3	0,00†
Si	23,8	58,7	
Utilización hospitalización			
No	95,6	92,5	0,00†
Si	4,3	7,4	
Días de hospitalización	3	3	0,80

*Diferencia significativa p<0,05, † X^2, U Mann-Whitney

al rechazo del modelo *probit* a favor del modelo *probit bivariado*, sobre el cual estaremos describiendo resultados y discutiendo conclusiones en lo sucesivo.

De acuerdo con el modelo *probit bivariado* se obtuvo que la probabilidad estimada de incurrir en GC para un hogar afiliado al SPS que tuvo necesidades de atención fue 7.7% menor, comparado con un hogar no afiliado en las mismas condiciones de necesidad (Tabla 3). Una vez controlando por el resto de covariables incluidas en el modelo se encontró que los hogares del estado de Campeche tuvieron una probabilidad mayor de GC, en comparación con los del estado de Colima. A partir de las simulaciones se encontró que la probabilidad de incurrir en GC fue menor para los hogares afiliados al SPS en ambos estados, especialmente en los de Colima.

Con relación a las variables de composición del hogar se encontró que cada integrante adicional en el hogar disminuye la probabilidad de incurrir en GC, ajustando por las demás covariables. Por el contrario, si el número de menores de cinco o mayores de 60 años de edad aumenta, la probabilidad de incurrir en GC aumenta también. En relación con el número de perceptores de ingreso, como se esperaba, por cada incremento en el número de éstos disminuye la probabilidad de incurrir en GC.

La edad del jefe del hogar se relacionó de forma positiva con el GC, pero de forma decreciente. Los hogares cuyo jefe era empleado tuvieron una probabilidad menor de GC, comparados con los que se dedicaban a una actividad no remunerada. Asimismo, los hogares del tercil más pobre del CDPC tuvieron una probabilidad mayor

Tabla 3. Modelos econométricos de Gastos Catastróficos en hogares de la Encuesta de Evaluación del Seguro Popular, en los estados de Colima y Campeche México, 2002

Variables	Modelo probit			Modelo probit bivariado		
	Coef.	P>|z|	EM%	Coef.	P>|z|	EM%
Seguro popular (1 = Si; 0 = No)*	0,06	0,44	1,6	-0,87	0,02	-7,7
Estado (1 = Campeche; Colima = 0)	0,29	0	8,1	0,36	0,00	7,1
Composición hogar						
Tamaño*	-0,10	0	-14,8	-0,08	0,00	-6,3
Índice de dependencia*	0,60	0	20,2	0,55	0,00	11,4
Edad jefe*	0,02	0,06	3,9	0,04	0,01	7,4
Edad jefe2*	0,00	0,04	0,0	0,00	0,01	-0,1
Actividad jefe*						
No remunerada	1	-	-	-	-	-
Trabajo	-0,14	0,08	-4,0	0,16	0,06	-1,8
Pensionada/incapacitado	-0,05	0,82	-1,5	0,04	0,88	2,8
Nivel socioeconómico Hogar						
Consumo disponible x tercil*						
III	1	-	-	-	-	-
II	0,16	0,05	4,5	0,21	0,01	3,5
I	0,88	0	26,1	0,84	0,00	3,3
Perceptores Ingreso*	-0,03	0,43	-5,0	-0,06	0,15	0,7
Necesidad atención salud hogar						
Severidad problema salud*						
Ninguna, leve moderada	1	-	-	-	-	-
Severa y combinación	0,40	0	11,8	0,37	0,00	3,6
Enfermos crónicos (1=Si; 0 = No)*	0,34	0	8,9	0,32	0,00	3,3
Discapacidad (1=Si; 0 =No)*	0,02	0,85	0,5	0,03	0,82	0,7
Utilización control prenatal (1 = Si; 0 = No)*	0,70	0	22,9	0,75	0,00	6,9
Utilización parto (1 = Si; 0 = No)*	0,49	0,03	15,4	0,45	0,03	4,4
Utilización hospitalización (1 = Si; 0 = No)	1,52	0	54,2	1,38	0,00	10,5
#Personas utilización ambulatoria*	0,19	0	5,0	0,17	0,00	16,8
Enfermedad crónica y utilización Hospitalización (1 =Si; 0 = No)*	-0,90	0,00	-14,9	-0,83	0,00	-6,8
Constante	-1,89	0		-1,86	0	
N	2127			2127		
rho				0,5678		
p X^2				0,102		

EM = Efecto marginal; *cambio porcentual en el gasto catastrófico por el cambio en la categoría de la variable dicotómica
• Cambio porcentual en el gasto catastrófico por cada unidad de aumento en la variable
º Cambio porcentual en el gasto catastrófico por cada unidad porcentual de aumento en la variable

de GC, comparados con los del tercil más rico. Como se esperaba, el tipo de necesidad y utilización de servicios de salud estuvieron positivamente relacionados con el GC.

A partir de las simulaciones se encontró que la probabilidad de incurrir en GC para ambos tipos de hogares fue en orden de importancia debido a: 1) la utilización de servicios de hospitalización; 2) la utilización de servicios de control prenatal; 3) la utilización de servicios de parto; 4) la utilización de servicios ambulatorios, y 5) y la presencia de enfermos crónicos (Figura 2). Adicionalmente, la probabilidad de incurrir en GC fue siempre mayor para los hogares más pobres independientemente de su estatus de afiliación.

Discusión

El principal hallazgo del presente estudio sugiere que el SPS protegió a los hogares afiliados contra el gasto catas-

trófico en salud, lo cual es consistente con otros estudios realizados en México en los que se ha encontrado menor gasto de bolsillo y catastrófico entre quienes tienen algún aseguramiento en salud, dentro de estos el SPS, comparados con los que no lo tienen, aunque dichos estudios no ajustaron por la endogeneidad de la afiliación a los esquemas de aseguramiento en salud con el GC (1,3,4,6,19). Los resultados sugieren también que los hogares más pobres tienen mayor probabilidad de GC que los hogares con mayor consumo disponible, hallazgo que es consistente con los resultados de otros estudios en México antes de la implantación del SPS (3,6). Pero un reciente estudio encontró que la reducción del gasto excesivo en salud entre los años 2000 y 2004 ha sido mayor para los hogares de los dos primeros quintiles y para los no asegurados o afiliados al SPS, pero sin poder atribuir el efecto a este último (4).

El estudio sugiere que en el estado de Colima los hogares, independientemente de su estatus de afiliación tuvieron una menor probabilidad de incurrir en GC que los del estado de Campeche. Futuros estudios podrían explorar si existen diferentes condiciones de oferta, disponibilidad y organización de los servicios de salud entre ambos estados que pudieran explicar este hallazgo.

La relación del resto de las variables con la probabilidad de GC refleja las características de un hogar que hacen que éste pueda asumir mejor la carga financiera que representa el gasto de bolsillo y son consistentes con lo reportado en otros estudios (6,7,14). Solamente el tamaño del hogar tuvo una relación negativa con el GC, lo que no es consistente con los hallazgos reportados en estudios previos (14). Esto puede deberse a que un mayor número de personas puede estar relacionado con la generación de economías de escala en el hogar, una vez que se ha controlado por el número de dependientes económicos y perceptores de ingresos.

Es importante señalar que este estudio pudo subestimar el GC por los siguientes factores: a) por el punto de corte para definirlo, ya que para algunos hogares, especialmente los más pobres, la proporción del gasto en salud respecto al consumo disponible para ser considerado catastrófico puede ser menor (2) ; b) el utilizar el gasto alimentario como proxy para las necesidades de subsistencia de un hogar es una consideración reduccionista que sobreestima el consumo disponible, y c) por disponibilidad de información no pudieron ser considerados algunos otros costos como los relacionados con el transporte durante el proceso de búsqueda de atención, por lo que el gasto de los hogares en salud puede estar también subestimado (15).

Hay que tener en cuenta que para la fecha de la encuesta el SPS tenía poco tiempo de operación, lo que puede considerarse un período de prueba o ajuste. Por tal motivo, es posible que la contribución de éste a la reducción del GC subestime el efecto que pudiera tener una vez que el SPS se encuentre operando con un tiempo suficiente de experiencia, y que la población conozca mejor la forma de acceder a él. Adicionalmente, el estudio no toma en cuenta otros factores de nivel macroeconómico o de pertenencia a programas contra la pobreza como Oportunidades que también podrían haber contribuido al efecto observado (4).

El hecho de que existiera mayor número de embarazadas entre los hogares afiliados al SPS y de que además requirieran atención de parto señala que ocurre un efecto de selección adversa por parte de los hogares para la afiliación al SPS; esto es característico de los seguros voluntarios debido a que los hogares con mayores necesidades en salud tienen más incentivos para afiliarse (12). Este fenómeno debe ser considerado para la viabilidad futura del SPS.

En conclusión, los resultados del estudio sugieren que el SPS está cumpliendo con uno de sus principales objetivos al proteger financieramente a los hogares y de esta forma contribuyendo a que los hogares por el gasto en salud, no tengan que hacer grandes recortes a su presupuesto destinado a otras necesidades. Sin embargo, sigue constituyendo un reto llegar a la meta de reducir en 75 % el GC en la población objetivo. Lograrlo, implicará además de aumentar la afiliación, garantizar la cobertura efectiva del CAUSES, fortaleciendo la red prestadora de servicios de salud y disminuir otras barreras para el acceso a los servicios de salud, distintas a las financieras (3). Así como evaluar la inclusión en el CAUSES de la atención hospitalaria de enfermedades de alta prevalencia y muy alto costo, como la diabetes y enfermedades cardiovasculares. Lo anterior, cobra especial importancia ante fenómenos como el envejecimiento de la población y la transición epidemiológica.

Un segundo reto muy importante es continuar mejorando la equidad vertical en relación con el GC como uno de los componentes principales de la equidad financiera en el SPS. En este sentido, también será muy importante mantener la progresividad de los aportes anticipados, especialmente el régimen no contributivo para los hogares más pobres. Aunque hasta ahora no existen copagos, la Ley de Protección Social en Salud dejó abierta la posibilidad de cuotas moderadoras para evitar el riesgo moral, lo cual podría profundizar la distribución inequitativa del GC, así como imponer barreras financieras al acceso y

afectar la afiliación al SPS, especialmente si se implementarán para los hogares más pobres.

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Heterogeneous impact of the "Seguro Popular" program on the utilization of obstetrical services in Mexico, 2001-2006: A multinomial probit model with a discrete endogenous variable*

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This paper contributes to three important strands in the health economics literature. First, we add to the emerging body of knowledge on the impacts of novel public policies to finance the health care of the poor in developing economies (Gaviria et al., 2006; Trujillo et al., 2005;Wagstaff, 2007;Wagstaff et al., 2007), including recent innovative interventions in Mexico (Knaul and Frenk, 2005; Frenk et al., 2003; Gakidou et al., 2006; Sepúlveda et al., 2006).We find that the recently established "Seguro Popular" (SP) (or "People's Insurance") program in Mexico has had a robust, significantly positive effect on the access of poor women to obstetrical care, an important outcome measure of maternal and infant health.

Second, we add to the growing literature on the use of multinomial discrete choice models of the selection of health care providers, including Schwartz et al. (1988) in the setting of the Philippines, Akin et al. (1995) in Nigeria, Bolduc et al. (1996) in Benin, and Leonard (2007) in Tanzania, as well as recent path-breaking work on multiequation models involving discrete variables (Balia and Jones, 2004; Deb et al., 2006).We formulate amultinomial probit model that distinguishes between three mutually exclusive sites for delivering a baby: a health unit specifically accredited by Seguro Popular; a non-SP-accredited clinic run by the Department of Health (Secretaría de Salud, or SSA); and private obstetrical services. In what appears to be the first instance of such a technique, we then modify the standard multinomial probit model to explicitly account for the possible endogeneity of the household's binary decision to participate in Seguro Popular. Women in households that participated in the SP program, we find, had a much stronger preference for having a baby in a SP-sponsored unit rather than paying out of pocket for a private delivery. At the same time, participation in SP was associated with a stronger preference for delivering in the private sector rather than at an SSA-sponsored clinic. On balance, the Seguro Popular program reduced pregnant women's attendance at an SSA-sponsored clinic much more than it reduced the probability of delivering a baby in the private sector.

Third, we contribute to the nascent but expanding body of work on the heterogeneous impacts of policy interventions in the developing world, including the effect of antiretroviral treatment on labor force participation in Western Kenya (Thirumurthy et al., 2006), the effect of conditional cash transfers on schooling and nutrition in Nicaragua (Dammert, 2007) and Mexico (Djebbari and

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Smith, 2005; Chávez-Martín del Campo, 2006). Here, we find that the quantitative impact of the SP program varied with the woman's education and health, as well as the assets and location (rural vs. urban) of the household. In Section 2, we review the problem of access to obstetric care for poor women in Mexico, the basic structure of the Mexican health care system, and the introduction of Seguro Popular in 2001. In Section 3,we describe an econometric model of discrete household decision-making concerning the use obstetrical services. The model captures the possibility that a demand-side subsidy such as Seguro Popular can affect the household's relative ranking of the three obstetric service sites. We explicitly take into account the potential endogeneity of the decision to participate in Seguro Popular, and describe our strategy for evaluating heterogeneous impacts. Section 4 describes our database, the 2006 National Survey of Health and Nutrition (Encuesta Nacional de Salud y Nutrición, or ENSANUT; see Instituto Nacional de Salud Pública, 2006). Section 5 details our empirical results. Section 6 summarizes our findings, discusses the limitations of our research, and considers its implications for public policy and future research on health policy in developing economies.

Mexico's health care system and the "Seguro Popular" program

Health care access and financing in Mexico

Historically, access to health insurance coverage in Mexico was tied to employment in the formal economy. The principal sources of coverage for workers in these sectors were the Mexican Social Insurance Institute (Instituto Mexicano del Seguro Social, or IMSS), the Government Workers' Social Security and Services Institute (Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado, or ISSSTE), as well as insurance programs for employees of such state-run enterprises as PEMEX (petroleum) and SEDENA (national defense).Workers outside these specific sectors and participants in the informal economy had to attend government-sponsored facilities through the Department of Health (Secretaría de Salud, or SSA) or pay out of pocket for medical care at private hospitals or doctors' offices. These private facilities varied considerably in price, quality, and availability. On the one hand, a modern network of private health services for the middle and upper classes, located mainly in urban areas, served those individuals who had insurance coverage or could pay out of pocket for their health care. On the other hand, lower-priced private health services of variable quality, including informal providers such as midwives and traditional healers, were available to poor urban and rural families (Parker and Wong, 1997; Nigenda et al., 2003; Pagan et al., 2007).

The poorest households in the informal sector were thus left with essentially three options: foregoing health care; seeking whatever care was available from state-sponsored SSA clinics or other low-cost informal providers; or spending a large part of their income on private health care. This has, in fact, been the predicament of the poor in many developing economies (Wagstaff, 2007). In recent years, Mexico has adopted public policies intended to overcome these historical inequalities in health care coverage (Frenk et al., 2003). One especially important initiative has been PROGRESA (Program for Education, Health and Nutrition), later renamed Oportunidades, an incentive-based program designed to improve the health, nutrition and education of poor families with children (Behrman and Skoufias, 2006; Gertler, 2000, 2004; Hoddinott and Skoufias, 2004;

Skoufias and Parker, 2001; Skoufias, 2005). While PROGRESA / Oportunidades has increased poor families' demand for preventive health services and some types of primary care, coverage for more advanced forms of care has remained lacking. For a poor family, essentially any major illness was catastrophic.

Seguro Popular

In 2001, the government of Mexico launched Seguro Popular, a major new effort to improve access of the poor to qualified public health services. The Seguro Popular program specifically targeted poor families in both urban and rural areas of Mexico without access to any other form of private or public coverage (Torres and Knaul, 2003). Under this voluntary insurance plan, a household makes subsidized contributions, based on ability to pay, to a public fund to cover catastrophic spending on health care (Frenk et al., 2003). Access to medical care is guaranteed and provided through a publicly sponsored network of ambulatory health units, general and specialized hospitals. All SP-sponsored health facilities are certified as providing a minimum level of quality of care. Health centers and hospitals are accredited on the basis of their infrastructure, equipment, health personnel, range of medical services and other criteria.

In order to accommodate the process of health unit accreditation, Seguro Popular was rolled out gradually during 2001±2005. Five states (Aguascalientes, Campeche, Colima, Jalisco and Tabasco) were incorporated into the program in 2001 as part of a pilot study. An additional 15 states were integrated in the program in 2002; four more states were incorporated in 2003; and the remaining states were incorporated in during 2004 and 2005. By the end of 2005, all 32 of Mexico's states had been incorporated, and approximately 4million families (comprising about 12 million individuals) had signed up for the voluntary program (Secretaría de Salud, 2006).

Maternal health services

During the past two decades, policy makers in Mexico have adopted several different approaches to improving the health of mothers and infants. One strategy has been to enhance access to services within the existing system of state-run SSA sponsored clinics. This approach, however, has had limited impact. Those state-run SSA-sponsored units that did provide some obstetrical services lacked the full range of drugs and equipment, hired deficiently trained personnel, and maintained reduced hours of operation. As a consequence, a significant proportion of pregnant women preferred delivering their babies in the private sector, even though they had direct contact with state-run health facilities for their prenatal care, and even though many private-sector providers were unqualified midwives and traditional birth attendants (Instituto Nacional de Salud Pública, 2000). Such a pattern of prenatal care at public facilities followed by birth attendance in the private sector has been observed in other developing economies (Schwartz et al., 1988).

One objective of the Seguro Popular program was to remedy these persistent deficiencies. Apart from subsidizing health insurance coverage, the program has invested considerable resources in improving the quality and availability of secondary medical care provided in public facilities, including obstetric care. Accordingly, in the present research, we sought to evaluate whether enrollment in SP has specifically improved pregnant women's attendance at SP-accredited obstetrical facilities.

Given the historical preference for private obstetrical services over state-run facilities, we therefore distinguished between three different sites of care: an SP-accredited obstetric facility; a non-SP state-run health unit; and a private provider, including physicians and midwives.

Econometric model

Multinomial choice model with a discrete endogenous variable

We observe the discrete choice, y_1, made by a pregnant woman among three mutually exclusive sites for her obstetric care: a site run by the Department of Health (Secretaría de Salud, or SSA); a facility specifically accredited by Seguro Popular; or delivery by a physician or midwife in a private facility or at home. We denote these three choices by $y1 = 0,1,2$, respectively. (For clarity, we omit subscripts specific to each pregnant woman.) We also observe the binary decision, $y2$, made by the woman's household to enroll in Seguro Popular, where $y2 = 1$ if the household enrolls in SP, and $y2 = 0$ otherwise.

Let the quantities {w 0, w 1, w 2} represent the respective latent utilities associated with the three sites of obstetric care. We assume that the observed choice of the site of obstetric care is utility maximizing:

$$y_1 = i \text{ if} w_1^* = \max\{w_0^*, w_1^*, w_2^*\} \text{ for } i = 0, 1, 2 \qquad (1)$$

We further assume that the latent utilities depend linearly on observed exogenous variables, on the household's enrollment status in SP, and unobserved error terms:

$$w_0^* = \chi_0'\beta_0 + \gamma_0\gamma_2 + \varepsilon_0 \qquad w_1^* = \chi_1'\beta_1 + \gamma_1\gamma_2 + \varepsilon_1 \qquad w_2^* = 0 \qquad (2)$$

where (X_0, X_1) are vectors of observable explanatory variables, (β_0, β_1) are conformal vectors of unknown parameters, (γ_0, γ_1) are additional unknown coefficients of the variable y_2 that indicates enrollment in Seguro Popular, and (χ_0, χ_1) are unobserved error terms to be characterized shortly. Given that we observed only the choice with the highest latent utility, we recognize that we can identify only the differences in latent utility, and therefore we set the latent utility of private obstetric care equal to zero.

We further specify a binary discrete choice model of enrollment in Seguro Popular:

$$y_2^* = \chi_2'\beta_2 + \varepsilon_2 \;; \qquad y_2^* = \begin{cases} 0, \text{if } y_2^* < 0 \\ 1, \text{if } y_2^* \geq 0 \end{cases} \qquad (3)$$

where $y* 2$ is an unobserved latent variable, X_2 is a vector of determinants of the decision to enroll, β_2 is a conformal vector of unknown parameters, and ε_2 is a stochastic error term that we characterize below. While the

Mexican government has phased in Seguro Popular over time, thus determining when specific communities will be eligible for the program, the household's decision to enroll in SP nonetheless remains voluntary. Accordingly, we cannot exclude the possibility that the binary variable y_2 is endogenous. This potential endogeneity can be captured by correlations between the error term ε_2 in Eq. (3) and the error terms ε_0 and ε_1 in Eq. (2). To parameterize these correlations, we assume that each of the error terms ε_0 and ε1 has a marginal unit normal distribution N(0,1), and that:

$$\varepsilon_2 = \sigma_0\, \varepsilon_0 + \sigma_1\, \varepsilon_1 + \nu$$

Where σ_0 and_1 are unknown parameters, and _ is also a unit normal N(0,1) random variable that is distributed independently of ε_0 and ε_1. (For a similar error parameterization, see p. 1084 of Deb et al., 2006.) This error structure admits two types of unobserved heterogeneity. When the parameter σ_0 is non-zero, households have unobserved characteristics that influence their decision to enroll in SP and, at the same time, influence the pregnant woman's preferences for SSA-sponsored public clinic over private health care. When the parameter σ_0 is non-zero, households have unobserved characteristics that influence their decision to enroll in SP and, at the same time, influence the pregnant woman's preferences for an SP-sponsored unit over a private site.

Given (4), the error terms $(\varepsilon_0,\varepsilon_1,\varepsilon_2)$ have a trivariate normal distribution N(0,˙), where

$$\Sigma = \begin{pmatrix} 1 & 1 & \sigma \\ 0 & 1 & \sigma \\ \sigma_0 & \sigma_1 & 1+\sigma_0^2+\sigma_1^2 \end{pmatrix}$$

The variance-covariance matriz Σ is positive definite for all values of the parameters σ_0 and σ_1 . The corresponding correlation coefficient are Corr $(\varepsilon_0, \varepsilon_2) = \rho_0 = \sigma_0/\sqrt{\tau}$ and Corr $(\varepsilon_1, \varepsilon_2) = \rho_1 = \sigma_1\sqrt{\ }\tau$, where $\tau = 1 + \sigma_0^2 + \sigma_0$. We estimate the parameters $\beta=(\beta_0, \beta_1, \beta_2)$, $\gamma= (\gamma_0, \gamma_1)$, $\sigma=(\sigma_0, \sigma_1)$ in the model of Eqs. (1)-(4) by maximum likelihood. The details of construction of the likelihood function and parameter estimation are given in Appendix A.

Parameter identification

To identify the parameters of our structural model, we impose exclusion restrictions on the explanatory variables in X= (X0,X1,X2). Specifically, we took advantage of the fact that Seguro Popular has been gradually phased in over time in different states within Mexico. We therefore constructed three dummy variables, indicating whether the woman's locality of residence had been formally incorporated into Seguro Popular by the years 2002, 2003, and 2004. For example, a women residing in a locality incorporated in the year 2003 would be encoded as having dummies equal to 0 for 2002, 1 for 2003, and 1 for 2004. A woman residing in a locality that was not incorporated until 2005, when all remaining states were incorporated, would have zero-values for all three dummy variables. Thus, 2005 served as a reference year, while each dummy variable measured the marginal effect of incorporation into SP one year earlier. Because SP was only in the pilot phase during 2001, we did not specify a dummy variable for that year. We included the three dummy variables in the participation Eq. (3) but excluded them from the health care utilization Eqs. (1) and (2). In sensitivity analyses, we considered alternative measures of the availability of SP in the pregnant woman's state of residence, including an additional dummy variable for the pilot year 2001, a single binary variable indicating whether SP had been incorporated in the specific state at the time of delivery, as well as a continuous variable measuring the number of years that SP had been incorporated in the state at the time of delivery.

Measuring individual-level impacts

Given estimates of the parameters ($\hat{\beta}, \hat{\gamma}, \hat{\sigma}$)and any given vector of household characteristics X, we can compute the respective joint probabilities

$$P_{i,j}(X) = Pr(y_1 = i, y_2 = j | X, \hat{\beta}, \hat{\gamma}, \hat{\sigma}) \text{ for all } i = 0,1,2 \text{ and } j = 0,1$$

We can also compute the marginal probabilities

$$P_j(X) = Pr(y_2 = j | X, \hat{\beta}, \hat{\gamma}, \hat{\sigma}) \text{ for } j = 0,1,$$

where, for example, $P_1(X)$ is the probability of enrollment in SP. From these estimates we can also compute the conditional probabilities $P_{i|j}(X)=P_{i,j}(X)/P_j(X)$ for all i=0,1,2 and j = 0,1,where, for example, $P_{2|1}(X)$ denotes the predicted probability that a woman in a household with exogenous characteristics X will choose a private obstetrical site given that the household is enrolled in Seguro Popular.

We measured the individual-level impacts of SP on the probability of choosing site i = 0,1,2 as the difference in conditional probabilities:

$$I_i(X) = P_{i|1}(X) - P_{i|0}(X)$$

These site-specific measures of impact represent a generalization of the classic treatment effect. For a fixed vector of maternal and household characteristics *X*, the three site-specific measures of the individual-level impact of Seguro Popular necessarily sum to zero, that is, $I_0(X) + I_1(X) + I^2(X)=0$.

We computed these measures of individual impact $I_1(X)$ for several pre-specified values of the vector *X*, as described in the following section. We used Monte Carlo simulation methods to compute 95% confidence intervals, making repeated random draws from a multivariate joint normal distribution with mean ($\hat{\beta}, \hat{\gamma}, \hat{\sigma}$) and estimated asymptotic variance±covariance matrix ˆV, and with each draw re-computing the impact measures $I_i(X)$ for the specified value of *X*. The confidence intervals for each impact measure were then computed from the range of recomputed values of $I_i(X)$.

Analysis of heterogeneity of impact

Because our model is nonlinear, the marginal effects of changes in the principal treatment variable (that is, affiliation with Seguro Popular, or *y*2) depend on the values of the explanatory variables (that is, maternal and household characteristics, or *X*). Although it is commonplace to report these marginal effects at the sample means, we focused on the extent of heterogeneity in the impact of Seguro Popular at the individual level. We therefore computed the individual level impact measures $I_i(X)$ for four prototypical households or "cases," that is, four different sets of explanatory variables *X*. To assess whether the nonlinearity of our model was the principal source of heterogeneous treatment effects, we also tested interaction models, in which the structural parameters γ_0 and γ_1 in (2) depended linearly on the exogenous explanatory variables.

Comparison with simplified bivariate probit model

We compared our multinomial choice model (Eqs. (1)± (4)) with a simplified bivariate probit model, in which a pregnant woman has only two choices: a birth attended at a SP-sponsored facility (*y*1 = 1), or a birth elsewhere (*y*1 =

$$w_1^* = X_1'\beta_1 + \gamma_1 y_2 + \varepsilon_1, \quad w_0^* = 0; \quad y_1 = i \text{ if } w_i^* = \max(w_0^*, w_1^*)$$

which is equivalent to a probit specification in which a non-SP obstetric facility is the reference category. Retaining Eq. (3) for y_2 and setting $\varepsilon_0 = 0$ in Eq. (2), we obtain a two-equation probit model with a discrete endogenous variable (that is, *y*2) and an unconstrained correlation coefficient between the error terms. Such a model can be estimated by maximum likelihood as if it were a simple bivariate probit model. (See, for example, p. 183 in Maddala, 1983 and p. 853 in Greene, 2000.) For this purpose, we used the "biprobit" routine in Stata (StataCorp, 2005).

Data

ENSANUT survey data and analytical sample

Our principal source of data is the 2006 Mexican National Health and Nutrition Survey (Encuesta Nacional de Salud y Nutrición, or ENSANUT), conducted during November 2005 to May 2006 (Instituto Nacional de Salud Pública, 2006), a nationally representative cross-section of 48,304 households containing 206,700 individuals. ENSANUT contained information on respondents' education, employment, socioeconomic and demographic characteristics, prevalence of self-reported acute and chronic illnesses, as well as health care utilization and source of payment. We focused on the 5988 female respondents of reproductive age (15±49 years) who reported having delivered their last baby during 2001±2006. We then excluded 1900 respondents who reported delivering at a facility sponsored by employer based health insurance (IMSS, ISSSTE, and PEMEX), as well as an additional 198 observations that had missing values of the explanatory variables to be described below. These exclusions resulted in a sample of 3890, which served as the principal basis for our statistical analyses. We refer to this sample as the analytic sample.

Households covered by Mexico's employer-based plans are not legally entitled to participate in Seguro Popular. Accordingly, the exclusion of households covered by employer-based plans permitted us to focus sharply on the target population eligible for the Seguro Popular program. Given the lack of flexibility in Mexico's labor market, we considered it unlikely that our exclusion of women covered by employer-based plans produced a significant bias of self-selection. Nonetheless, in order to check the sensitivity of our results to our exclusion criterion, we

repeated our analyses with two alternative samples that were not drawn on the basis of household insurance coverage: (1) an enlarged sample of 5762 adult women who had a baby since 2001 and who had no missing values for any explanatory variables; and (2) a restricted sample of 1934 adult women whose household resided in a locality with a moderately high or very high index of socioeconomic marginality ("índice de marginación") (CONAPO, 2005).

Dependent variables

As noted in Section 3, our two discrete dependent variables were: y1, the site of obstetric care; and y_2, the binary decision to enroll in Seguro Popular. With respect to the former, each respondent to ENSANUT who had her last baby during 2001±2006 was asked where she delivered her baby. With respect to the latter, the person in charge of the household was asked about each household member's medical coverage.

Table 1 shows the joint distribution of the two dependent variables in our analytic sample of 3890 women. Among the households who did not participate in SP, nearly half paid out of pocket for obstetrical services in the private sector, while the other half had their babies in clinics sponsored by the Secretaría de Salud. Among the households that did participate in SP, the great majority of women (72%) had their babies in an SP sponsored unit, but nearly 21% still paid out of pocket for private obstetrical services. Table 1 shows that about 2% of women whose households reported not enrolling SP nonetheless reported a birth at an SP-sponsored facility. Apparently, some women whose households had not been enrolled in SP during their pregnancies were enrolled in SP "on the spot" upon their arrival in labor at an SP-sponsored facility.

Given that the measurement of these dependent variables was based on self-reported survey responses, we performed a number of checks for reliability. To check whether the decision to participate in Seguro Popular is made at the household level, we verified that 90% of the respondents who reported themselves as enrolled in SP belonged to households in which the remaining members were likewise enrolled in the SP program. Moreover, we verified that 95% of the women reporting participation in SP lived in a household where the person in charge reported a date of affiliation in SP for at least one household member.

We also addressed the possibility that some women who reported current SP participation were not in fact eligible for SP at the time of their delivery. Seguro Popular was rolled out gradually over time in different states throughout Mexico, with most states enrolling in 2002± 2004 and all states enrolled by 2005. The official dates of incorporation of each state in SP need to be regarded as approximate, as many localities may not have complied with legally established deadlines. In a separate sensitivity analysis, we reclassified a total of 195 women as not enrolled in SP and not delivering a baby in an SP-accredited facility if the woman reported a date of delivery at an SP sponsored facility before the official year of incorporation of SP in the state or before the reported date of enrollment reported on the household questionnaire. We then repeated our analyses on this reclassified sample.

Table 1. Obstetric care in Mexico, by type of facility sponsorship, for women in families with and without Seguro Popular (SP), 2001-2006[a]

	With SP		Without SP	
	N	%	N	%
Childbirth in a facility sponsored by				
Secretaría de Salud (SSA)	65	7.13	1514	50.84
Seguro Popular	657	72.04	49	1.65
Private facility	190	20.83	1415	47.52
Total	912	100.00	2978	100

Source: Calculations based on ENSANUT (Instituto Nacional de Salud Pública).

[a] Based upon all women who reported their most recent birth during 2001-2006, exclusive of all women whose households reported insurance through IMSS, ISSSTE, PEMEX, SEDENA or other form of Seguridad Social (Social Security).

Independent variables and instrumental variables

Our independent variables consisted of individual- and household-level data from ENSANUT, supplemented by data from external sources on the characteristics of the locality or state of the woman's residence (Secretaría de Salud, 2005). Individual-level variables included the woman's age and age squared, educational attainment, marital status, parity, primary language (indigenous vs. Spanish), and the presence or absence of three self reported conditions: depression, diabetes, and high blood pressure. (The Spanish texts of these and the previously noted questionnaire items are given in Sosa-Rubí et al., 2007.) Household-level variables included: the presence of young children; rural versus urban location; the proportion of women in the locality who had employment-based health insurance (IMSS, ISSSTE, etc.); the density of public health units in the locality; and an asset index, based upon household infrastructure, building materials, and ownership of certain durable assets, as a proxy for household's wealth (McKenzie, 2004).

Table 2 shows the descriptive statistics for the independent variables, as well as the marginal proportions of the dependent variables, in our analytic sample. Approximately half of the women had no more than a primary school education, more than a third lived in a rural area, and nearly a quarter spoke an indigenous language. The average family in our sample had low assets and lived in a locality where only 1 in 10 families had employment-

Table 2. Descriptive statistics

	Analystic sample (N=3890)[a]			
	Mean	**S.D.**	**Minimum**	**Maximum**
Individual characteristics of woman				
Age	29.80	6.49	18	49
Educational attainment: No education[b]	0.06	0.23	0	1
Educational attainment:Primary school[b]	0.43	0.50	0	1
Educational attainment: High school[b]	0.31	0.46	0	1
Educational attainment: professional/University[b]	0.20	0.40	0	1
Married[b]	0.82	0.38	0	1
Speaks indigenous language[b]	0.23	0.42	0	0
Parity	3.43	2.19	1	18
Childbirth in a facility sponsored by				
Secretaría de Salud (SSA)[b]	0.41			
Seguro Popular[b]	0.18			
Private[b]	0.41			
Reported depresión[b]	0.11	0.31	0	1
Reported diabetes[b]	0.01	0.10	0	1
Reported high blood pressure[b]	0.11	0.31	0	1
Household characteristics				
Family with children ≤ 7 year old[b]	0.92	0.27	0	1
Asset index	-0.25	0.91	-1.99	1.58
Access to Seguro Popular program by the family[b]	0.23	0.42	0	1
Household in rural locality[b]	0.36	0.48	0	1
Municipality and state characteristics				
Population of households with Seguro Social[c]	0.10	0.08	0	0.67
Health centers per 100 women[d]	0.84	0.62	0.08	5.17
State incorporated into SP program by 2002[b]	0.64			
State incorporated into SP program by 2003[b]	0.79			
State incorporated into SP program by 2004[b]	0.92			

Source: Calculations based on ENSANUT (Instituto Nacional de Salud Pública, 2006: Secretaría de Salud, 2005, 2006).

[a] Based upon all women who reported their most recent birth during 2001-2006, exclusive of all women whose households reported insurance through Seguridad Social.

[b] Binary variable.

[c] Seguridad Social includes: IMSS, ISSSTE, PEMEX, SEDENA or other form of Social Security.

[d] 1010 observations were imputed at the sample mean value.

based health insurance, and where there were fewer than 1 health center per 100 women. The ratio of the maximum to the minimum density of health centers was nearly two orders of magnitude, and indicated enormous variability in access to formal health services.

For instrumental variables, as described in Section 3.2 above, we constructed dummy variables for each of 3 years (2002, 2003, and 2004), where the dummy variable for a particular year indicated whether the Seguro Popular had been officially incorporated in the woman's state of residence by that year. The process of incorporation entailed decisions at the state and federal level, rather than at the level of the individual client or health center. We know of no evidence that such decisions suffered from "policy endogeneity," that is, states with the highest probability of attracting a pregnant mother to a health center were incorporated earlier. We recognize that the official dates of incorporation are not exact indicators of program availability, since some health centers were still undergoing accreditation by the end of the year. We therefore view these instruments as indicators of likelihood that SP was available to each household in the survey. Our use of year-of incorporation dummies as instruments is thus analogous to Duflo's use of distance from schools as instruments in her study of impact of school construction on educational attainment and wages in Indonesia (Duflo, 2001). The year-of-incorporation dummies were thus excluded from Eqs. (1) and (2) determining the effect of SP enrollment on the site of delivery. However, in a sensitivity analysis to test for the possibility of nationwide trends in obstetric utilization, we did include in Eqs. (1) and (2) dummy variables representing the year in which a pregnant woman delivered her baby.

Results

Table 3 presents the results of the simplified bivariate probit model of obstetric care utilization and enrollment in SP for the analytic sample. We show the estimated marginal effects only for the utilization equation on the left (corresponding to Eq. (7)), but not for the enrollment equation on the right (corresponding to Eq. (3)). In the utilization equation, the significantly positive coefficient for enrollment in SP supported the hypothesis that Seguro Popular has had an effect on obstetric utilization. The estimated marginal effect, which is equivalent to our measure of the impact of the individual-level impact of SP, is 0.430. That is, controlling for other factors affecting the choice of delivery site, a woman in a family enrolled in SP had a probability of giving birth at an SP-accredited facility that was 43 percentage points higher than a woman in a family not enrolled in SP.

In Table 3, the estimated coefficient of correlation of the error terms is negative and significantly different from 0. While the finding of a non-zero correlation coefficient might support the conclusion that enrollment in SP is an endogenous variable, the negative sign is difficult to explain on the basis of the estimates alone. The other covariates in the enrollment equation do not reveal any related anomalies. In particular, women in rural localities with a higher availability of health centers are more likely to enroll in SP. One might conclude that unobserved factors enhanced the probability of enrollment in SP and, at the same time, diminished the probability of having a baby at an SP-accredited facility. An alternative interpretation, however, is that the simplified bivariate model is not correctly specified.

We therefore turn to Table 4, which shows the results of our full multinomial probit model (Eqs. (1)±(4)) for the analytic sample. The column denoted "SSA vs. Private" refers to a woman's preference for giving birth at an SSA-sponsored facility in comparison to a private facility, which serves as the reference category. It corresponds to the equation for the latent variable w^*_0 in Eq. (2). The column denoted "SP vs. Private" refers to a woman's preference for having a baby at a SP-sponsored facility in comparison to a private facility. It corresponds to the equation for the latent variable w^*_1 in Eq. (2). Finally, the column denoted "SP Enrollment" refers to the household's preference for enrollment in Seguro Popular, and corresponds to the equation for the latent variable y^*_2, that is, Eq. (3).

In the column "SSA vs. Private," the estimate of the parameter γ_0 is negative and highly significant, while in the column "SP vs. Private," the estimate of the parameter g1 is positive and highly significant. Accordingly, women in households that participated in the SP program had a much stronger preference for having a baby in a SP-sponsored unit rather than paying out of pocket for a private delivery. At the same time, however, participation in SP was associated with a stronger preference for delivering in the private sector rather than at an SSA-sponsored clinic.

The estimated correlation coefficients ρ_0 and ρ_1 in the multinomial probit model of Table 4 present a different pattern than that observed in the simplified bivariate probit model of Table 3. The estimate of ρ_0 is significantly positive, while the estimate of ρ_1 is indistinguishable from 0. Accordingly, there were unobserved factors

Table 3. Bivariate probit model of obstetric care utilization and enrollment in Seguro Popular

	Childbirth in SP-sponsored facility		Enrollment in Seguro Popular (SP)
	Coefficient	Marginal effect*	Coefficient
Individual characteristics			
Age/10	-0.038 [0.462]	-0.003 [0.037]	0.159 [0.296]
[Age/10]^2	-0.006 [0.074]	-0.0004[0.006]	-0.023 [0.047]
Primary education[b]	-0.186 [0.157]	-0.014 [0.012]	**0.267 [0.105]***
Secondary education[b]	**-0286 [0.168]***	**-0.021 [0.011]***	**0.298 [0.112]****
University education[b]	-0.195 [0.188]	-0.014 [0.012]	-0.115 [0.127]
Maried[b]	0.170 [0.105]	**0.012 [0.007]***	0.085 [0.064]
Speaks indigenous language[b]	-0.103 [0.106]	-0.008 [0.007]	**-0.287 [0.059]****
Parity	0.009 [0.021]	-0.001 [0.002]	0.009 [0.010]
Reported depression[b]	0.086 [0.112]	0.007 [0.010]	0.099 [0.078]
Reported diabetes[b]	0.163 [0.261]	0.015 [0.027]	**0.453 [0.201]***
Reported high blood pressure[b]	-0.055 [0.112]	-0.004 [0.008]	0.107 [0.074]
Household characteristics			
Enrollment in Seguro Popular[b]	**2,153 [0.319]****	**0.430 [0.117]****	
Household in rural locality[b]	0.005 [0.103]	0.0004 [0.008]	**0.323 [0.057]****
Family with children ≤7 years old[b]	0.096 [0.0121]	-0.008 [0.011]	-0.082 [0.084]
Asset index	-0.042 [0.051]		-0.012 [0.034]
Locality and state characteristics			
Proportion of households with Seguridad Social[c]	**2.950 [0.537]****	**0.234[0.0523]****	**-2.386 [0.378]****
Health centers per 100 women	-0.020 [0.064]	-0.002 [0.005]	**0.204 [0.038]****
State incorporated into SP by 2002[d]			**0.296 [0.065]****
State incorporated into SP by 2003[d]			**0.158 [0.084]***
State incorporated into SP by 2004[d]			**0.414 [0.120]****
Constant	-2.218 [0.730]**		**-1.745 [0.484]****
Coefficient of correlations of error terms			**-0.537 [0.232]***
Observations	3890	3890	3890

Bod values to estimates that are significant at the 10% or 1% level.

[a] Marginal effects evaluated at the mean values of the independent variables (as given in Table 2). Marginal effects correspond to discrete changes of dummy variables from 0 to 1.

[b] Binary variable.

[c] Seguridad Social includes: IMSS, ISSSTE, PEMEX, SEDENA or other form of Social Security.

[d] Instrumental variable.

that enhanced the probability of enrollment in SP and, at the same time, enhanced the probability of preferring an SSA-sponsored facility to a private delivery. In less formal terms, mothers in households attracted to Seguro Popular were more likely to prefer a delivery in state-run SSA-sponsored facilities than to pay out of pocket for a private delivery. The ability of our multinomial model to differentiate between two different types of endogeneity (as specified in Eqs. (2) and (4)) thus permits us to resolve the apparent paradox of a negative correlation coefficient in the simplified bivariate probit model of Table 3.

The estimates in the enrollment equation in Table 4 supported the validity of our year-of-incorporation dummy variables as instruments. The dummy variables for all 3 years were significant. The significant negative coefficient for the year 2003, during which only four of Mexico's 32 states were incorporated into SP, implies a reduced marginal effect on enrollment in that year compared to 2004. However, the sum of the dummy variables for 2003 and 2004, which represents the cumulative effect of early incorporation from 2003 onward, was positive (that is, –0.324 + 0.588 = 0.264, standard error 0.142). Likewise, the sum of the three dummy variables, which represents the cumulative effect of early incorporation from 2002 onward, was significantly positive (that is, +0.384–0.324 + 0.588 = 0.648, standard error 0.145). Alternative specifications for these instrumental variables, including the addition of a dummy variable for 2001, the specification of a

Tabla 4. Multinomial probit model

Individual characteristics	SSA vs private	SP vs private	SP enrollment
Age/10	0.316 [0.270]	**0.783 [0.466]***	0.149 [0.401]
(Age/10)^2	**-0.072 [0.043]***	-0.120 [0.074]	-0.020]0.064]
Primary education[a]	**0.226 [0.097]***	**-0.328 [0.164]***	**0.338 [0.154]***
Secondary education[a]	0.168 [0.1003]	**-0.314 [0.176]***	**0.372 [0.163]***
University education[a]	**-0.387 [0.111]****	**-0.613 [0.197]****	-0.184 [0.173]
Married[a]	**0.206 [0.059]****	-0.021 [0.104]	0.105 [0.088]
Speaks indigenous language[a]	**-0.321 [0.055]****	**-0260 [0.099]*****	**-0.372 [0.103]****
Parity	-0.001 [0.009]	-0.034 [0.022]	0.011 [0.013]
Reported depression[a]	0.067 [0.071]	-0.141 [0.120]	0.140 [0.109]
Reported diabetes[a]	**0.549 [0.233]**	**0.593 [0.301]***	**0.613 [0.290]***
Reported high blood pressure[a]	**0.202 [0.071]**	0.094 [0.117]	0.176 [0.109]
Household characteristics			
Family with children ≤7 years old[a]	-0.072 [0.080]	-0.126 [0.130]	-0.146 [0.119]
Asset index	**-0.143 [0.031]****	-0.070 [0.052]	-0.041 [0.048]
Household in rural locality[a]	**0.169 [0.061]****	0.030 [0.102]	**-0.417 [0.108]****
Proportion of households with Seguridad Social[b]	0.297 [0.391]	1.828 [0.595]**	**-3.420 [0.858]****
Locality and state characteristics			
Health centers per 100 women	**0.204 [0.039]****	0.104 [0.064]	**0.270 [0.071]****
State incorporated into SP by 2002[c]			**0.384 [0.106]****
State incorporated into SP by 2003[c]			**0.324 [0.135]***
State incorporated into SP by 2004[c]			**0.588 [0.194]****
Constant	-0.060 ^0.426]	**-2.828 [0.748]****	**-2.110 [0.733]****
y_0	**-1.988 [0.165]****		
y_1		**2.792 [0.286]****	
σ_0	**0.901 [0.390]***		
σ_1		-0.143 [0.259]	
Coefficient of correlation, p_0	**0.666 [0.159]****		
Coefficient of correlation, p_1		-0.106 [0.187]	
Observations	3890	3890	3890

Bod values to estimates that are significant at the 10%, 5% or 1% level.

[a] Binary variable.

[b] Seguridad Social includes: IMSS, ISSSTE, PEMEX, SEDENA or other form of Social Security.

[c] Instrumental variable.

single indicator of the incorporation of SP at the time of delivery, as well as the number of years that SP had been incorporated at the time of delivery, all gave very similar parameter estimates. (Results not shown.)

Moreover, in the enrollment equation in Table 4, residence in a rural locality, a lower proportion of families enrolled in employment-based insurance, and a higher density of health centers all had a significant positive effect, while the women's speaking an indigenous language had a significant negative coefficient. Self-reported diabetes, education, and indigenous language had significant effects in the site of delivery equations as well.

As noted in Section 3.4 above, we tested interaction models in which the structural parameters γ_0 and γ_1 in Eq. (2) depended linearly on the exogenous explanatory variables. However, these models generally did not show significant interaction effects. (Results not shown.) As noted in Section 4.3 above, we also conducted a sensitivity analysis to test for the possibility of nationwide trends in obstetric utilization. To that end, we added dummy variables representing the year in which a pregnant woman delivered her baby into Eqs. (1) and (2). However, none of these annual dummy variables was significant and they were thus dropped from analyses reported in Table 4.

Given the parameter estimates based upon the multinomial probit model in Table 4, we computed the measures of individual-level impact described in Section 3.3. At the mean values of the independent variables, the pre-

dicted probability of enrollment in SP (that is, P1(X) in Section 4.3)was 20.9%, and the corresponding individual-level impact on having a baby at an SP-accredited facility (that is, I1(X) in Eq. (6))was 70.6% (95% CI,65.7±75.0). The latter measure of impact was significantly larger than the marginal effect of 40.3% estimated from the simplified bivariate probit model in Table 3. In less formal terms, our multinomial probit model detected an impact of Seguro Popular on the decision to have a baby at an SP-accredited site that was nearly double the impact estimated from a simplified bivariate probit model.

Table 5 and Fig. 1 show our computations of the individual-level impact of SP enrollment for four representative cases, that is, four profiles of women based on different values of the explanatory variables. The details of each profile are shown in the notes to Table 5. Cases 1

Table 5. Individual-level impacts of Seguro Popular on obstetric care utilization in Mexico, by rural vs. urban area, health and socioeconomic status (SES)*

	Probability (%)	
	Mean	**95% CI**
Case 1: Rural area, low health and SES		
Probability of enrolment in Seguro Popular	43.65	
Impact of SP on probability of delivering a baby at		
Secretaría de Salud (SSA)	-62.56	-72.31 to -41.20
Seguro Popular	82.09	59.13 to 84.29
Private	-19.52	-41.98 to -0.69
Case 2: Rural area, medium health and SES		
Probability of enrolment in Seguro Popular	51.51	
Impact of SP on probability of delivering a baby at		
Secretaría de Salud (SSA)	-49.32	-59.03 to -39.61
Seguro Popular	61.24	43.00 to 77.05
Private	-11.91	-26.19 to 4.46
Case 3: Urban area, medium health and SES		
Probability of enrolment in Seguro Popular	53.43	
Impact of SP on probability of delivering a baby at		
Secretaría de Salud (SSA)	-68.80	-75.33 to -54.04
Seguro Popular	78.91	53.29 to 84.33
Private	-10.11	-25.22 to 4.25
Case 4: Urban area, high health and SES		
Probability of enrolment in Seguro Popular	0.16	
Impact of SP on probability of delivering a baby at		
Secretaría de Salud (SSA)	-39.77	-62.25 to 5.51
Seguro Popular	65.15	21.41 to 78.54
Private	-25.38	-50.74 to -5.26

Case 1: A 30-year-old woman, without primary education, speaks an indigenous language, parity 5, married in a household with a minimum asset index and with young children at home, lives in a rural locality with an average density of health centers but no households enrolled in Social Security, and reports depression, diabetes, and high blood pressure. Case 2: A 30-years-old woman, with secondary education, speaks Spanish, parity 3, married in a household with an average asset index and young children at home, lives in a rural locality with an average density of health centers but no households enrolled in Social Security, and does not report depression, diabetes, and high blood pressure. Case 3: A 30-years-old woman, with primary education, speaks Spanish, parity 5, married in a houseold with a minimum asste index and young children at home, lives in a urban locality with an average density of health centers but no households enrolled in Social Security, and report depression, diabetes, and high blood pressure. Case 4: A 30-years-old woman, with university education, speaks Spanish, parity 1, married in a houseold with a mean asset index and young children at home, lives in a urban locality with an average density of health centers and the highest density of household enrolled in Social Security, and does not report depression, diabetes, and high blood pressure.

[a] Derived from multivariate probit estimates at different values of explanatory variables, described below

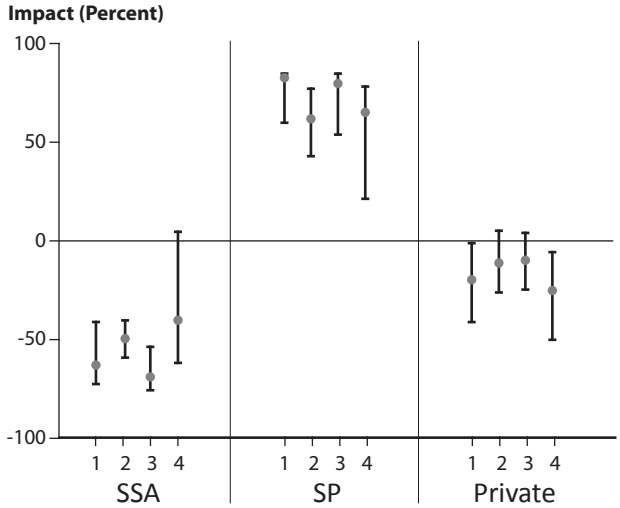

Figure 1. Individual-level impact of Seguro Social (SP) on the probability of delivering a baby at a site run by the department of health (SSA), a unit sponsored by Seguro Popular, and a private facility

and 2 refer to women residing in rural areas. For Case 1 (a rural woman without any formal education, who speaks an indigenous language, has low socioeconomic status and reports all three medical conditions), the probability of enrollment in SP was P1(X) = 43.65%, while the individual-level impact was I1(X) = 82.09% (95% CI, 59.13±84.29). By contrast, for Case 2 (a rural woman with at least primary school, who speaks Spanish, has comparatively higher socioeconomic status and does not report medical conditions), the estimated probability of enrollment in the SP was higher (51.51%), but the individual-level impact was notably lower (61.24%; 95% CI, 43.00±72.05). The difference between the individual-level impacts in Cases 1 and 2 was 20.85% (95% CI, –6.96 to 35.88).

Cases 3 and 4 refer to women residing in urban areas. For Case 3 (an urban woman with primary education, who speaks Spanish, has low socioeconomic status and reports depression, diabetes, and high blood pressure), the probability of enrollment in SP was 53.43%, while the individual-level impact was 78.91%. By contrast, for Case 4 (an urban woman with a university education, who speaks Spanish, has elevated socioeconomic status and does not report medical conditions), the estimated probability of enrollment in the SP was 0.16%. Among the very few women with this profile who enroll in SP, the individual-level impact on delivering in an SP-accredited facility was 65.15%.

Table 5 and Fig. 1 show not only the individual-level impacts on delivering at a SP-accredited facility, but also the corresponding individual-level impacts on having a baby at a SSA-sponsored health unit (that is, I0(X)) and a private facility (that is, I2(X)). In each of the four cases, but especially in Cases 1 through 3, the Seguro Popular program reduced pregnant women's attendance at an SSA-sponsored clinic much more than it reduced the probability of delivering a baby in the private sector.

As noted above, we carried out sensitivity analyses on three alternative samples: the extended sample, the restricted sample, and the reclassified sample. In all cases, our multinomial probit estimates were robust with respect to different assumptions about the study population and the definitions of the dependent variables. The full results are reported in Sosa-Rubí et al. (2007).

Discussion and conclusions

In this paper, we found that the recently established Seguro Popular program in Mexico has had a significantly positive effect on the access of poor women to obstetrical care, an important outcome measure of maternal and infant health. Women in households that participated in the SP program, we found, had a much stronger preference for having a baby in a SP-sponsored unit rather than paying out of pocket for a private delivery. At the same time, participation in SP was associated with a stronger preference for delivering in the private sector rather than at an SSA-sponsored clinic. On balance, the Seguro Popular program reduced pregnant women's attendance at an SSA-sponsored clinic much more than it reduced the probability of delivering a baby in the private sector. These findings were robust with respect to variations in the population under study, the classification of subjects' survey responses, and the specification of the statistical model.

We formulated a multinomial probit model that permitted us to go beyond the standard two-way dichotomy between utilization and non-utilization as outcome measures in the evaluation of policies designed to subsidize and increase access to health care. We found that the conventional bivariate probit approach suffered from apparent problems of model misspecification, with a peculiarly negative correlation coefficient between error terms in the obstetrical utilization and Seguro Popular enrollment equations. What is more, estimates based the standard two-equation approach understated the impact of Seguro Popular on obstetrical utilization by 40%.

Our modification of the multivariate probit model to account of a discrete endogenous variable appears to

be the first instance of such a model specification. Early applications of multinomial discrete choice models in the selection of health care providers include the works of Schwartz et al. (1988) in the setting of the Philippines, Akin et al. (1995) in Nigeria, and Bolduc et al. (1996) in Benin, and most recently Borah (2006) in India and Leonard (2007) in Tanzania. However, these papers did not explicitly incorporate endogeneity of the treatment or policy variable into the multinomial choice framework.

Other investigators have employed variations of the now-standard bivariate probit model, in which an endogenous binary participation variable enters on the right-hand side of a probit utilization equation. (See Bertranou (1998) in the setting of Argentina; Cameron et al. (1988) in Australia; Gitto et al. (2006) in Sicily; Sapelli and Vial (2003) in Chile; Suraratdecha et al. (2005) in Thailand; Waters (1999) in Ecuador.) Trujillo (2003) specified a binary utilization variable as well as two endogenous binary variables to represent participation in both public and private insurance programs in Colombia.

Still other researchers have considered multi-equation models in which one or more equations entailed a discrete endogenous variable. Munkin and Trivedi (2003) specified a three-equation model in which one demand equation entailed Poisson-distributed count data, the second demand equation contained a continuous exponential dependent variable, and the third participation equation involved a binary dependent variable representing self-selection of insurance coverage. Deb et al. (2006) specified a multi-equation model for health care utilization, in which the first equation was a probit model of non-zero health-care utilization, the second was conditional log-linear expenditure model, and the third was a multinomial probit model for choice of insurance coverage. The latter model, like that of Munkin and Trivedi (2003), was estimated by Markov chain Monte Carlo simulation techniques. Balia and Jones (2004), in a study of health habits and mortality, specified a recursive multi-equation model, in which each binary lifestyle variable (such as smoking) served as a dependent variable in a behavioral equation and as a regressor in a mortality equation. Meyer hoefer and Pylypchuk (2008) specified a three-category ordered probit model for body mass index that contained a discrete endogenous variable representing participation in the US Food Stamp Program. Our model in this paper can be readily estimated by full maximum likelihood, taking advantage of now-standard techniques to evaluate three-dimensional probit integrals, such as the GHK simulator written by Cappellari and Jenkins (2006). (See Appendix A.)

We based our analysis of heterogeneous impacts on four cases, which represented different profiles of women based on the values of the observed independent variables. While the simulated confidence intervals around the impact measures were relatively wide, nonetheless we observed significant variability in individual-level impacts. A comparison of Cases 1 and 2, both women residing in urban areas, is illustrative. A woman in Case 1 spoke an indigenous language, had low socioeconomic status and reported multiple medical conditions, while a woman in Case 2 had a primary school education, spoke Spanish, had comparatively higher socioeconomic status, and did not report any medical conditions. In Case 1, the individual-level impact of Seguro Popular on the probability of having a baby at a SP-accredited facility was 21 percentage points higher than in Case 2, and the 95% confidence interval of this difference in individual-level impacts ranged from –7% to +36%.

In our analysis of heterogeneous impacts, we relied upon the nonlinearity of our econometric model. In addition, we tested the effects of interactions between treatment variables and other explanatory variables. Having specified a parametric joint distribution for the error terms $(\varepsilon_0,\varepsilon_1,\varepsilon_2)$, we did not explore more generalized non-parametric procedures, such as quan tile treatment effects regression (Djebbari and Smith, 2005; Dammert, 2007), and thus our analysis does not capture the full extent of heterogeneity of program impact due to variations in un observables.

Our empirical findings on the substantial impact of Seguro Popular confirm the preliminary results reported by Gakidou et al. (2006), who found a positive relation between hospital discharge rates per capita and the rate of SP enrollment in a regression analysis of a cross-section of Mexican municipalities. These authors also reported a positive relation between the probability of using health services and SP enrollment, conditional on perceived need, based upon a cross-sectional regression study of the 2006 ENSANUT survey, but details of the methodology were not reported.

Our observational study has a number of limitations. We relied upon self-reported data, which inevitably contains response errors. Although we performed a number of reliability checks of our data, uncertainty due to errors in reporting cannot be eliminated. Nonetheless, our results remained robust with respect to changes in the sample analyzed and the definitions of the dependent variables. We have no direct measures of the characteristics of the obstetric facilities selected by the pregnant women and their families. It is well recognized that such characteristics are a

critical determinant of the choice of site of care (Leonard, 2007). In the case of obstetric services in Mexico, direct measurement of the level of training of personnel, accessibility of rural sites, and the state of medical equipment would be very valuable, especially if we are to assess the adequacy of the accreditation process employed by Seguro Popular. Measurement of the quality of state-run SSA-sponsored sites would be valuable in determining *why* SP-enrolled women expressed a much stronger preference for SP-accredited sites over SSA-sponsored sites.

We distinguished between SP-accredited health units, SSA-sponsored facilities, and private care. While we excluded women who had employment-based health insurance from our analytic sample, the category of "private care" nonetheless remains heterogeneous, ranging from the services of private obstetricians within hospitals to traditional midwives who work outside the hospital setting. In our ENSANUT analytic sample, the latter category comprised only 10.36% of all reported deliveries. (Results not shown.) Increasing the number of sites of obstetric care would have required additional computational resources to evaluate a four-dimensional probit model in samples with up to 6000 observations.

Finally, our analysis covers the time period 2001±2006, during which the Seguro Popular program was being gradually phased in throughout Mexico. Within the limits of currently available data, we cannot test the hypothesis that the impact of Seguro Popular has changed as the Mexican people have come to learn of its advantages, or as the quality of SP-accredited facilities has further improved.

A number of findings in Table 4 give us cause for concern. The coefficients for women who speak an indigenous language are negative, that is, non-Spanish speaking women appeared less likely to enroll in and take advantage of Seguro Popular. The family asset index has a negative coefficient in the equation for SSA versus Private, suggesting that some poor families were still paying out of pocket for private care. The coefficient for a rural household is significant in the SP enrollment equation, but is not significant in the equation for SP versus Private, suggesting that rural households enrolled in SP but pregnant women within those households did not take advantage of the program. These findings suggest a continued focus on the availability of Seguro Popular for the very poorest and particularly indigenous households in rural areas.

Perhaps the most troubling findings, however, are the relative impacts on SSA-sponsored and private obstetrical care that we observed in Table 5. On balance, enrollment in Seguro Popular reduced deliveries at state-run SSA-sponsored facilities much more than it reduced the use of private obstetrical services. One explanation is that SSA-sponsored facilities, in which trained staff and adequate equipment are not guaranteed, may be perceived as low quality. In the language of consumer theory, the obstetric care at state-sponsored SSA facilities may be an inferior good. The demand-side subsidy of medical care for all members of an SP-affiliated household may have an income effect, which may then diminish the demand for SSA sponsored care. In less formal terms, when SP pays for treatment of the complications of a parent's diabetes, a pregnant daughter may be able to afford a private obstetrician.

Other possible explanations for the reduced impact of SP on private obstetric care are less compelling. For example, we have no evidence that private providers dropped prices in response to SP entry into the market. Nor do we have evidence SP selectively certified only the highest quality state-run facilities, thus rendering the remaining SSA-sponsored units even less qualified. Likewise we lack evidence that private facilities may be serving as alternatives to SP-sponsored facilities with inadequate capacity. SP-accredited obstetric facilities were not necessarily available in every locality, so that the choice between an SP-accredited and an SSA sponsored unit was not simply a passive decision made by clinic personnel. More research is required to determine *why* poor uninsured Mexican women still pay out of pocket for obstetrical care despite the substantial impacts of Seguro Popular documented in this paper.

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Appendix A. Construction and estimation of log likelihood function

We derive the contribution to the log likelihood for each of the six possible cases {(y1,y2)|y1 = 0,1,2; y2 =0,1}. First consider an observation where y1 =0, y2 = 1, that is, where the pregnant woman chooses an obstetric site sponsored by the Secretaría de Salud, and where the household decides to enroll in Seguro Popular. From Eqs. (1)±(3), we conclude

that $-w_0^* < 0, w_1^* - w_0^* < 0, -y_2^* < 0$ or, equivalently, $A\begin{pmatrix} w_0^* \\ w_1^* \\ y_2^* \end{pmatrix} < \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$, where $A = \begin{pmatrix} -1 & 0 & 0 \\ -1 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$ and where the vector inequality holds for each coordinate. Given Eqs. (1)–(3), the foregoing implies $A\begin{pmatrix} X_0'\beta_0 + \gamma_0 y_2 + \varepsilon_0 \\ X_1'\beta_1 + \gamma_1 y_2 + \varepsilon_1 \\ X_2'\beta_2 + \varepsilon_2 \end{pmatrix} < \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$, or

$$A\begin{pmatrix} \varepsilon_0 \\ \varepsilon_1 \\ \varepsilon_2 \end{pmatrix} < A\begin{pmatrix} -X_0'\beta_0 - \gamma_0 y_2 \\ -X_1'\beta_1 - \gamma_1 y_2 \\ -X_2'\beta_2 \end{pmatrix} \tag{A.1}$$

The vector $A\begin{pmatrix} \varepsilon_0 \\ \varepsilon_1 \\ \varepsilon_2 \end{pmatrix}$ on the left-hand side of (A.1) has trivariate normal distribution with zero means and variance–covariance matrix $A\Sigma A' = \begin{pmatrix} 1 & 0 & \sigma_0 \\ 0 & 2 & \sigma_0 - \sigma_1 \\ \sigma_0 & \sigma_0 - \sigma_1 & \tau \end{pmatrix}$ where $\Sigma = \begin{pmatrix} 1 & 0 & \sigma_0 \\ 0 & 1 & \sigma_1 \\ \sigma_0 & \sigma_1 & \tau \end{pmatrix}$ and $\tau = 1 + \sigma_0^2 + \sigma_1^2$. Moreover, the expression $A\begin{pmatrix} -X_0'\beta_0 - \gamma_0 y_2 \\ -X_1'\beta_1 - \gamma_1 y_2 \\ -X_2'\beta_2 \end{pmatrix}$ on the right-hand side of (A.1) is equivalent to $\begin{pmatrix} X_0'\beta_0 + \gamma_0 \\ X_0'\beta_0 + \gamma_0 - X_1'\beta_1 - \gamma_1 \\ X_2'\beta_2 \end{pmatrix}$. We thus conclude that the contribution of this observation to the log likelihood is

$$L_{01} = \ln \Pr(y_1 = 0, y_2 = 1 | \boldsymbol{X}, \beta, \gamma, \sigma) = \ln \Phi_3\left(\begin{pmatrix} X_0'\beta_0 + \gamma_0 \\ X_0'\beta_0 + \gamma_0 - X_1'\beta_1 - \gamma_1 \\ X_2'\beta_2 \end{pmatrix}, \begin{pmatrix} 1 & 0 & \sigma_0 \\ 0 & 2 & \sigma_0 - \sigma_1 \\ \sigma_0 & \sigma_0 - \sigma_1 & \tau \end{pmatrix}\right) \tag{A.2}$$

In (A.2), the term $\Phi_3(\nu, \Omega)$ denotes $\Pr[V < \nu]$, where V is a three-dimensional vector of random variables with a trivariate normal distribution with zero means and 3 × 3 variance–covariance matrix Ω.

More generally, for each of the six cases $\{(y_1 = j, y_2 = k) | j = 0,1,2;\ k = 0,1\}$, the vector inequality (A.1) holds for a suitably chosen matrix

$$A_{jk} = \begin{pmatrix} -j^2 + 3j - 1 & j^2 - 2j & 0 \\ -0.5j^2 + 1.5j - 1 & (-1)^j & 0 \\ 0 & 0 & (-1)^k \end{pmatrix} \tag{A.3}$$

The corresponding contribution to the log likelihood function is

$$L_{jk} = \ln \Pr(y_1 = j, y_2 = k | \boldsymbol{X}, \beta, \gamma, \sigma) = \ln \Phi_3(A_{jk}Z, A_{jk}\Sigma A_{jk}') \tag{A.4}$$

where $Z = \begin{pmatrix} -X_0'\beta_0 - \gamma_0 y_2 \\ -X_1'\beta_1 - \gamma_1 y_2 \\ -X_2'\beta_2 \end{pmatrix}$. These contributions to the log likelihood function entail three-dimensional probit integrals, which we evaluated by means of the GHK simulator written by Cappellari and Jenkins (2006).

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Diabetes treatment and control: the effect of public health insurance for the poor in Mexico*

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Lack of health insurance can deprive the poor of access to services or put them at risk of financial hardship. To protect the poor against excessive health expenditures, many countries have implemented mechanisms such as community-based health insurance,[1,2] national health insurance[3-6] and targeted public health insurance.[7,8]

Mexico has multiple health insurance providers. The *Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado* [State Employee's Social Security and Social Services Institute, *ISSSTE*] provides coverage for government employees and the *Instituto Mexicano del Seguro Social* [Mexican Social Security Institute, *IMSS*] covers for private-sector employees. By 2001, however, nearly half of the Mexican working-age population had no health insurance.[9] The *Seguro Popular* [People's Insurance], launched that year, represented a major effort to protect the working-age population against steep health-care costs. Enrolment in the *Seguro Popular* is not dependent on health status or pre-existing illness, there is no co-payment in accordance with the type of health care received, and family contributions are determined solely by ability to pay.[10] Medical interventions are offered mainly through the public health network. The *Seguro Popular*, which covers health care for many diseases, including cancer, asthma, anaemia, pneumonia and diabetes,[11] was implemented gradually between 2001 and 2005, but only in communities with health units having accreditation, that is, the proven capacity ± medical resources, personnel and infrastructure, etc. ± to provide the health interventions covered by the *Seguro Popular*. Thus, during the implementation phase, people chose to enrol based largely on programme availability at the regional level, and this, in turn, was determined by health infrastructure capacity.

Background

According to WHO estimates, by 2030, approximately 366 million adults will have diabetes (type 2 in over 90% of the cases), and 75% of these adults will be living in developing countries.[12] In Mexico, type 2 diabetes is the leading cause of death among adults, according to the 2007 National Death Registry.[13] Data from the 2005±2006 cross-sectional Encuesta Nacional de Salud y Nutrición [National Health and Nutrition Survey, ENSANUT] showed that 7.1% of adults reported having been diagnosed with type 2 diabetes by a physician.14 Test results based on fasting blood serum samples collected for the ENSANUT suggest that a large number of

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Mexican adults have undiagnosed diabetes and that the estimated overall prevalence of diabetes is about 14%. (S Villalpando, personal communication).

Diabetes requires life-long treatment and periodic clinical follow-up. Health care is needed on a regular basis to attain good control of blood glucose levels, blood pressure, blood lipids and body weight; to reduce or delay the onset of complications, and to delay or prevent death from the disease. Periodic health-care visits (three to four per year, according to Mexican and international guidelines) should include laboratory testing to assess the need for more aggressive therapy.[15,16]

Lifestyle intervention, including a healthy diet and physical activity, is the first line of treatment for diabetes, but the American Diabetes Association and the European Association for the Study of Diabetes[17] recommend aggressive treatment of the disease, including early initiation of insulin therapy. Diabetes management also involves close monitoring for chronic complications affecting the kidneys, eyes or feet.[15,16]

In Mexico, the total annual cost of managing diabetes and its complications in 2000 was estimated at over 15 billion United States dollars (US$), of which approximately US$ 765 million represented direct medication costs.[18] In that same year, an estimated 44% of adults who had been previously diagnosed with diabetes in Mexico reported having no health insurance.[19]

Diabetic patients who lack health insurance are less likely to adhere to medical care.[20] The *Seguro Popular* was intended to improve the treatment options and laboratory tests available to Mexicans with diabetes, as well as to ensure their access to appropriate medication.

Previous empirical research suggests that people who are *Seguro Popular* beneficiaries have better access to health care than those who are not. Bleich et al.[21] found that hypertensive adults enrolled in the *Seguro Popular* were more likely to be treated for high blood pressure and to attain good control. Sosa-Rubí et al.[22] found that pregnant women enrolled in the *Seguro Popular* were more likely to receive formal obstetric care.

This paper examines the effect of *Seguro Popular* enrolment on access to health care, specifically health resources (medical visits, laboratory tests and use of medication, including insulin injections), and on blood glucose control (as measured by glycosylated haemoglobin, HbA1c, the gold standard for blood glucose control surveillance).[15,16] An HbA1c test is required at least twice a year for diabetes patients with stable blood glucose and at least four times a year for patients without stable blood glucose or for those who have just begun or changed therapy.[16] To reduce confounding in the observational data analysed, we used propensity score matching to estimate the average treatment effect, with "treatment" defined as enrolment in the *Seguro Popular*.

Our working hypothesis was that enrolment in the *Seguro Popular* improves access to treatment and health outcomes among patients with diabetes. This hypothesis is consistent with the stated goal of the *Seguro Popular*: to improve access to qualified and specialized health services among poor and uninsured Mexicans.

Methods

From the 2005±2006 ENSANUT we obtained data on treatment, medical care and biological outcomes in diabetes patients.[14] The ENSANUT is a nationally representative survey that in 2005±2006 had a sample of 48 304 households and 206 700 individuals. We selected a subsample of 2960 adults with diabetes (i.e. adults who had been diagnosed with diabetes by a physician or who reported being under treatment for diabetes). After we excluded pregnant women with hyperglycaemia (assumed to have gestational diabetes), adults with access to social security services, and responses with missing data,our final sample for analysis included 1491 adults (Fig. 1).

Adults (aged 20±80 years) provided the following information: number of visits to physicians for diabetes control; frequency and type of treatment (diet, alternative medicines or standard drug therapy, such as insulin and oral hypoglycaemic agents); and access to laboratory tests, including testing frequency. In addition, a random subsample of patients (n = 1115) was selected for HbA1c testing.

Variables

We analysed access outcomes and biological outcomes. The first included access to laboratory tests; four or more yearly visits to a physician for diabetes control; treatment with any drug, including insulin; number of weekly insulin injections (if on insulin); and number of blood glucose control tests per month.

Biological outcomes were based on blood glucose control, as determined by HbA1c levels. We constructed two indicators of glucose control on the basis of recommended levels of HbA1c. Patients were initially categorized as having "appropriate glucose control" (HbA1c ≤ 7%) or "poor glucose control" (HbA1c > 7%) and were then further classified in accordance with the more ex-

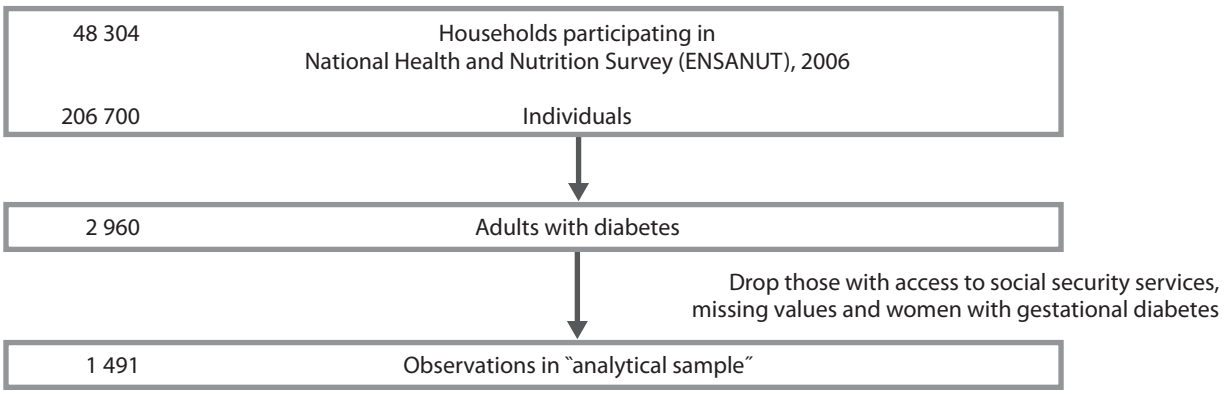

Figure 1. Selection of participants: a flow diagram

treme values: "very poor glucose control" (HbA1c > 12%) or "appropriate and poor glucose control" (HbA1c ≤ 12%). Patients in the "very poor glucose control" category were those having the poorest outcomes and the highest risk of premature death and complications.[23]

For analysis, health insurance status, as reported by surveyed individuals, was the exposure variable. We compared individuals enrolled in the *Seguro Popular* ("treatment" category) with individuals who reported having no insurance (control category).

We assessed characteristics of the individual, the household and the state as treatment predictors: for the individual, age, sex, education and ethnicity; for the household, family assets (as a proxy for family wealth) and rural or urban residential area; for the state, the general region of the country (north, east central, west central and south± southeast). We also considered potential confounders (e.g. using body mass index, BMI, as a proxy for lifestyle) and time since diabetes was diagnosed.

Finally, data from Mexico's 2005 *Registro Nacional de Infraestructura en Salud* [National Registry of Health Infrastructure] was added to determine whether the availability of health professionals (i.e. the numbers of physicians and nurses) and health units per 1000 population modified the treatment effect. [24] To estimate the number of physicians, nurses and health units per 1000 population, we used 2005 census data for municipalities generated by Mexico's National Geographical Institute.[25]

Statistical methods

Because enrolment in the *Seguro Popular* is voluntary, health insurance status is not randomly allocated and the data may be subject to self-selection bias. To reduce this bias, we used standard propensity score matching. We first constructed a propensity score that estimated the probability of enrolment in the *Seguro Popular* given a set of predictors, and we then created a control group (uninsured) and a treatment group (insured) having similar propensity scores. We used a logistic regression model to estimate the conditional probability of *Seguro Popular* enrolment, given a set of covariates (X). Nearest neigh bour matching allowed us to match insured and uninsured individuals with similar propensity scores.[26,27]

If outcomes are assumed to be independent of programme participation after controlling for propensity score, the average treatment effect is:

$$ATT = E\,[E\,[Y_1 |\, SP_i = 1, p(X_i)] \pm E\,[Y_0 \mid SP_i = 0, p(X_i)]]$$

where $SP_i = 1$ if the individual is enrolled in the *Seguro Popular* and $SP_i = 0$ if not; and where the expectations [E] are conditional on treatment status, as represented by the vertical bar. ATT is the difference between the mean outcomes for those treated (Y_1) and for those untreated (Y_0), after controlling for observed variables with the propensity score $p(X_i)$.

To ensure comparability, we tested the balancing property: pre-treatment covariates did not differ statistically between *Seguro Popular* enrolees and people without health insurance. [28] We followed the algorithm suggested by Dehejia and Wahba[29,30] to find the best model specification. The method involved the use of different specifications until we obtained a balanced distribution of the following covariates: sex, age, family asset index, residence area, residence region, ethnicity, education and marital

status. Furthermore, we estimated the percentage bias reduction by calculating the difference in absolute bias between treated and control groups as a percentage of the square root of the average of the sample variances.[31]

We performed sensitivity analysis to test the association of HbA1c results with the potential lifestyle confounders (using BMI as a proxy for lifestyle) and the time since diabetes was first diagnosed. We also checked the independent effect of *Seguro Popular* enrolment and of health professional availability on the coverage of diabetes treatment and control. This involved estimating a multivariate model using matched data for two outcomes: regular use of any blood glucose control test and proportion of patients with "very poor glucose control". We adjusted the multivariate model with clustering for the potential effect modifier of health professional availability, as determined by the number of physicians, nurses and health units in a given location compared with the median for the entire municipality.

Results

Table 1 presents the socio demographic characteristics of the uninsured population and of the population enrolled in the *Seguro Popular*. The table shows both raw (unmatched) and matched means. In the unmatched sample, adults enrolled in the *Seguro Popular* had less formal education and fewer family assets but were more likely to be female and married and to live in rural areas and in Mexico's West central and South±southeast regions, than uninsured adults. In the matched samples, the differences between *Seguro Popular* enrolees and uninsured individuals (i.e. the bias)[31] were considerably smaller for most of the variables. The t test for some predictors still showed statistical significance for the entire sample; however, for the propensity score estimation, the t test showed statistically insignificant differences for the covariables at each of the seven propensity score blocks (results not shown).

Table 2 shows the logistic regression model for propensity scores. In the model, females and married people were more likely to be enrolled in the *Seguro Popular*, as were adults with diabetes who had fewer assets or who lived in rural areas or in the west central region.

Table 3 presents differences in health outcomes between individuals with and without insurance. Those enrolled in the *Seguro Popular* reported, on average, greater access to blood glucose control tests of any type (including urine and capillary blood reactive strips) and more blood glucose control tests per month. After propensity matching, these differences became significant. The proportion of adults with diabetes who were under insulin treatment was similar between groups, and matched differences were not significant. However, among adults who used insulin, those enrolled in the *Seguro Popular* received, on average, 3.13 more insulin injections per week than those without insurance. Uninsured insulin users received a median of seven insulin injections per week (probably one injection per day), while insured insulin users received a median of 14 insulin injections per week (probably two injections per day). In addition, those enrolled in the *Seguro Popular* had more blood glucose tests per month and a greater likelihood of having visited a physician four times or more per year.

Finally, *Seguro Popular* enrollees had appropriate glucose control, based on HbA1c levels, in greater proportion than uninsured patients (8.9% versus 7.4%, respectively). Conversely, uninsured patients had very poor glucose control in greater proportion than *Seguro Popular* enrollees (46.2% versus 36.7%, respectively). On the basis of propensity score matching, the average treatment effect was an increase of 5.6 percentage points in those with appropriate control and a decrease of 17.5 percentage points in those with very poor glucose control. These differences are of obvious clinical importance.

In sensitivity analyses, we examined whether the number of physicians, nurses or health units per 1000 population altered the model in terms of the regular use of some type of blood glucose control test. After adjustment for *Seguro Popular* enrolment, no odds ratio (OR) showed statistical significance. However, the interaction term that showed a greater availability of physicians among *Seguro Popular* enrollees was significant and positive. People insured through the *Seguro Popular* and who lived in municipalities with an above-median number of physicians per 1000 population had considerably higher odds of regularly using any glucose control test (OR: 15.85; z-statistic: 2.62).

We then analysed the interaction between the number of physicians, nurses and health units per 1000 population and the "very poor glucose control" indicator. Municipalities with more health units per 1000 population had a greater likelihood of being the place of residence of those with "very poor glucose control" (OR: 3.17; z-statistic: 2.08). Similarly, *Seguro Popular* enrolees and people living in areas with more nurses per 1000 population had a greater likelihood of not having "very poor glucose control" (OR: 4.59; z-statistic: 1.75).

Sensitivity analyses showed that the association between potential confounders (BMI as proxy for lifestyle

Table 1. Sociodemographic characteristics of adults with diabetes enrolled in the *Seguro Popular* and of uninsured adults, Mexico, 2006.

	Unmatched samples			Matched samples			Percentage reduction in bias
	Seguro Popular[a]	Uninsured[a]	t-test	Seguro Popular[a]	Uninsured[a]	t-test	
	n = 430	*n* =1061	*P*-value	*n* = 495	*n* = 1029	*P*-value	
Individual characteristic							
Sex							
Male[b]	30,9	40,1					
Female	69,1	59,9	0,001	68,9	69,9	0,115	89,1
Age, in years							
20-39	17,5	16,3	0,558	17,2	15,1	0,709	-69,0
40-59	50,0	48,2	0,518	50,12	55,3	0,002	-179
60-79	29,4	31,8	0,378	29,7	26,6	0,109	-30,7
≥ 80[b]	3,0	3,9					
Marital status							
Married	73,1	64,8	0,002	72,9	80,2	0,000	12,5
Unmarried[b]	26,7	35,3					
Education							
Noneb	21,4	21,6					
Primary	66,8	57,7	0,001	66,8	64,2	0,018	72,5
Secondary	8,7	12,6	0,032	8,7	8,5	0,166	94,0
High school/college	2,8	8,4	0,000	2,8	3,0	0,000	95,8
Ethnicity (self-identified)							
Indigenous	23,8	23,3	0,83	24,1	26,8	0,016	-442
Not indigenous[b]	76,3	76,7					
Family assets							
Mean (asset index)[c]	-0,504	-235	0,000	-0,495	-0,493	0,000	76,9
Regional characteristic							
Area of residence							
Metropolitan	20,9	42,0	0,000	20,9	22,1	0,000	94,5
Urban	39,9	32,3	0,005	40,0	37,6	0,049	69,4
Rural[b]	39,4	25,8					
Region of residence							
North	16,4	19,7	0,136	16,5	13,4	0,001	8,4
East central	15,7	26,9	0,000	15,8	15,1	0,002	93,7
West central	39,6	26,3	0,000	39,5	39,8	0,000	98,3
South–southeast[b]	27,9	26,9					

a Values are percentages, unless otherwise noted; percentages may not add up to 100% due to rounding error.

b Omitted (reference) category. Table reports nearest neighbour matching with common support. The t test for each covariable may show statistical significance for the variable evaluated for the entire sample; however, for the propensity score, t tests for insignificant differences were conducted at each propensity score block (results not shown). The percentage of bias reduction reports reduction in absolute bias between the treatment category (Seguro Popular enrollees) and the control category (the uninsured) as a percentage of the square root of the average of the sample variances in the treated and non-treated groups[31]

c The asset index is based upon household infrastructure, building materials, and ownership of certain durable assets, as a proxy for household's wealth. It may be negative because it is constructed with principal components analysis. A more negative index indicates lower household wealth.

Estimations based on data from the 2006 Encuesta Nacional de Salud y Nutrición.[14]

Table 2. Logistic model[a] of a propensity score to estimate the effect of *Seguro Popular* enrolment on diabetes treatment and control in Mexico, 2006. (n= 1479)

Variable	Probability of enrolment in the *Seguro Popular*		
	Coefficient	Z-value	P-test
Individual characteristic			
Sex			
Female	0.43	3.27	0.001
Age, in years			
20-39	0.44	1.16	0.246
40-59	0.3	0.78	0.434
60-79	0.11	0.3	0.763
Marital status			
Married	0.43	3.06	0.002
Education			
Primary	0.18	1.15	0.249
Secondary	-0.20	-0.77	0.444
High school/college	-0.61	-1.67	0.094
Ethnicity			
Indigenous	-0.13	-0.88	0.381
Household characteristic			
Family assets	-0.26	-3.41	0.001
Regional characteristic			
Area of residence			
Metropolitan	-0.03	-0.18	0.860
Urban	0.80	-4.77	0.000
Region of residence			
North	0.23	1.19	0.233
East central	-0.43	-2.39	0.017
West central	0.48	3.1	0.002

a Log-likelihood ratio test, X^2 (degrees of freedom): 139.15 (15); probability > X^2 = 0.000.

and time since diabetes first diagnosed) and health-care outcomes was not significant. Such confounders were significantly associated with the biological outcomes but did not substantially modify the results presented already. The additional covariates showed no significance in the propensity score model.

Discussion

The findings of this study suggest that the *Seguro Popular* has improved both access to health services and biological health outcomes among adults with diabetes. Over the past 20 years, various countries in Latin America ± Argentina, Brazil, Chile and Colombia ± have implemented health insurance reform to improve the coverage of marginalized groups.[32] The current study demonstrates the success of an insurance programme targeted to the poor in Mexico. Its results may be relevant for other populations living in a similar socioeconomic setting and may help to shape programmes for improving access to health services and health status among the poor.

Although adults with diabetes who were *Seguro Poular* enrolees had better access to health care and better blood glucose level control, the effect of enrolment on biological outcomes was modest: a large proportion of both the insured and uninsured remained in the "very poor glucose control" category. It is too early to determine whether the *Seguro Popular* will reduce premature deaths from the chronic complications of diabetes, but continued emphasis on quality of care and treatment will be necessary to meet this long-term goal.

Limitations

This study has limitations. It is crosssectional, hence it captures only a single point in time. Responses to questions about the past are subject to recall bias. Furthermore, self-reported outcomes, such as the number of visits to a physician, are subject to reporting bias. The biological tests performed provide more objective measures. Although we controlled for many variables that influence insurance choice (including age, sex, marital status and residential region), other factors (e.g. genetic or environmental) could also make an individual more prone to diabetes and less likely to enrol in the *Seguro Popular*. We also assumed (as is common in studies with propensity score matching) that unobservable components could be ignored.

Health insurance for the poor is a relatively new concept and its effect has not been widely evaluated yet. The results provided here are among the very few based on an assessment of individual health status indicators. As the *Seguro Popular* programme is quite new, these are early results; effects over the longer term should be the subject of future research.

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Table 3. Average effect of enrolment in the *Seguro Popular* in termes of diabetes treatment and control, Mexico, 2006.

Outcome variable	Mean		Unmatched			Matched		
	Seguro Popular	Uninsured	Unmatched difference[b]	*t*-value	*P*-value	Matched ATT[c] (95% CI)	*t*-value	*P*-value
Health care access outcome								
Regular use of any blood glucose control test[d]	0.809	0.754	0.055	2.300	***	0.095 (0.020 - 0.161)	2.626	***
No. of insulin users	0.0415	0.0479	-0.0064	-0.504	NS	0.001 (-0.032 - 0.034)	0.066	NS
No. of insulin shots per week among insulin users	12.6	8.99	3.600	2.922	***	3.133 (0.04 - 6.22)	1.988	**
No. of blood sugar control tests per month	1.02	0.87	0.144	0.825	NS	0.142 (0.024 - 0.260)	2.371	***
Four or more physician visits per year	0.918	0.811	0.107	4.795	***	0.093 (0.032 - 0.154)	3.019	***
Biological outcome								
Proportion of diabetics with appropriate glucose control[e]	0.089	0.074	0.015	0.624	NS	0.056 (0.009 - 0.103)	2.316	***
Proportion of diabetics with very poor glucose control[f]	0.367	0.462	-0.095	-2.122	***	-0.175 (-0.285 - 0.065)	-3.159	***

** $P < 0.05$; *** $P < 0.01$, using t tests, of mean differences between treatment and control (unmatched and matched) groups.
ATT, average treatment effect on the treated; CI, confidence interval; NS, not significant.

[a] The data are not weighted.
[b] This is the raw difference between unmatched samples, or the difference between the mean observed in Seguro Popular enrollees and the mean observed in the uninsured population.
[c] The ATT is based on the differences in mean outcome for propensity-score-matched individuals using nearest neighbour matching.
[d] Tests may include urine or capillary blood reactive strips, blood glucose, or glycosylated haemoglobin (HbA1c).
[e] Appropriate glucose control (HbA1c ≤ 7%) compared with poor glucose control (HbA1c > 7%).
[f] Very poor glucose control (HbA1c > 12%) compared with normal and poor glucose control (HbA1c ≤ 12%).

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Cash and in-kind transfers in poor rural communities in Mexico increase household fruit, vegetable, and micronutrient consumption but also lead to excess energy consumption*,[1-3]

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In the past decade, conditional cash transfer programs (CCT)[⊠] have become an important strategy implemented by developing countries to break the intergenerational transmission of poverty. The objective of these programs is to reduce short-term household vulnerability and to invest in long-term human capital accumulation through interventions in health, nutrition, and education. CCT programs have been shown to have positive impacts on poverty reduction, health, nutrition, and education (1). Approximately 20 countries worldwide currently have CCT programs (2).

The first CCT program, PROGRESA (now called *Oportunidades*), started in Mexico's rural areas in 1997 and was expanded to urban areas in 2002. Because of the program's health and education components (3), it is only available in communities with a nearby school and health clinic. As a consequence, a number of poor rural communities without nearby education or health services were excluded from the program. To attend to the needs of these communities, the Mexican government launched a food support program called *Programa de Apoyo Alimentario* (PAL). PAL provides households with a cash or an in-kind transfer. PAL was designed as a conditional program, which means that receiving the benefits would be conditional on attending nutrition and health education sessions, as well as participating in program-related logistic activities.

The impact of CCT programs on household (food) consumption has been studied in Mexico, Honduras, Nicaragua, Colombia, and Brazil (3±8). CCT programs have positive effects on short-term poverty alleviation, total household expenditure, and household food expenditure. They have also been found to have a positive effect on the quality of the household diet, as shown in increased spending on animal-source foods. Studies in Mexico, Nicaragua, and Brazil also found a positive impact on the consumption of fruits and vegetables. The acquisition of energy from animal products was found to increase as a consequence of the program in Mexico, Honduras, and Nicaragua (6,9). A limitation of the available literature is

[⊠] Abbreviations used: AE, adult equivalent; CCT, conditional cash transfer program; PAL, Programa de Apoyo Alimentario.

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[3] Supplemental Table 1 is available with the online posting of this paper at jn. nutrition.org.

that no study to date, to our knowledge, has documented the impact on household nutrient consumption.

Given the coexistence of a high prevalence of micronutrient deficiencies (e.g. iron deficiency anemia) with a very high prevalence of overweight and obesity in Mexico (10) and many of the countries where CCT programs are implemented, it is important to better understand the nutritional nature of the changes in household food consumption caused by conditional transfer programs. The first objective of this study was to investigate whether the PAL transfer lead to the consumption of healthier household diets. We estimated the program's impact on household energy and macro- and micronutrient consumption. The second objective was to evaluate whether the cash and in-kind transfers had a differential effect on these outcomes.

Participants and Methods

The PAL and its evaluation.

The PAL started in 2003 and is targeted to communities that do not receive benefits from other federal food aid programs, have <2500 inhabitants, and have a high level of marginalization. Marginalization is a term used in Mexico for the multidimensional assessment of poverty in a community. It takes into account housing quality (including the percent of households without piped water, sewage, and electricity), income (proportion of household below 2 times the minimum wage), education (including illiteracy), and urbanization (11). Targeting at the community level was not completely as planned, because 37% of the selected communities had a medium rather than a high level of marginalization (12). Households within these communities were eligible if they fell below the "needs" poverty line as defined by the Mexican Ministry of Social Development. This corresponds to an income level sufficient to cover basic needs in food consumption, health, and education (13).

When the program started in 2003, it provided beneficiary households either a cash transfer of 150 Mexican pesos/mo (equivalent to ~14 USD at the time) or a monthly food basket with a cost to the program of 150 pesos. The size of the cash transfer and the amount of food was the same for all households, i.e. no adjustments for family size or composition were made. The value of the food basket at local prices was ~30% higher for consumers than the actual cost to the program (12). The basket contained a number of staple and basic food products and powdered whole milk (Liconsa), which was fortified with Zn, Fe, vitamin C, and folate (Table 1). The energy and nutrition composition of the fortified milk has been reported elsewhere (14). The composition of the food basket conformed to the Mexican norm for food aid programs (NOM-169-SSA1±1998), which states that food transfers need to provide at least 20% of the recommended daily energy and protein requirements (15). The basket was designed to contribute 450 kcal (1883 kJ)/d per adult in an average-sized household. Households received the transfer once every 2 mo. Beneficiary households were required to attend nutrition and health education sessions and had to participate in program-related logistic activities to receive the benefits. These program conditions, however, were not strictly enforced.

A community, randomized, controlled intervention trial was used to evaluate the impact of the intervention. A random sample of 208 rural communities was drawn from the pool of eligible communities in 8 of the poorest states in the south/eastern region of Mexico (Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Campeche, Yucatan, and Veracruz). Within each community, a random sample of 33 households was selected (12). The baseline survey was conducted from October 2003 to April 2004. After baseline data collection, the 208 selected communities

Table 1. Composition of the food basket

Food item	Quantity
Powdered fortified (Zn, Fe, vitamin C, folate) milk, *kg*	1.920
Beans, *kg*	2.000
Rice, *kg*	2.000
Corn flour, *kg*	3.000
Soup pasta, *kg*	1.200
Vegetable oil, *L*	1.000
Cookies, *kg*	1.000
Powdered chocolate, *kg*	0.400
Corn starch, *kg*	0.100
Cereal (ready-to-eat), *kg*	0.200
One of these items:	
Sardine/tuna, *kg*	0.240
Dry meat, *kg*	0.100
Lentils, *kg*	0.500

(6687 households) were randomly assigned to 1 of 4 study groups: food basket without education (52 communities, 1657 households), food basket with education (52 communities, 1680 households), cash transfer with education (53 communities, 1687 communities), or control (51 communities, 1663 households). Treatment allocation was carried out by the Ministry of Social Development. No households had actually begun to receive benefits at the time of the baseline survey. The control communities were put on the waiting list for later incorporation into the program. Of the 208 communities randomly assigned to the 4 study groups after the baseline survey, 2 communities (corresponding to 66 households) refused to participate in the follow-up survey (Supplemental Table 1). An additional 802 households were excluded from the analysis because of missing or incomplete data. Full data were thus available for 5823 households (food basket without education: 51 communities, 1447 households; food basket with education: 52 communities, 1500 households; cash transfer with education: 53 communities, 1492 communities; control 50 communities, 1384 households).

The follow-up survey was conducted from October to December 2005 in the same communities and households, thus creating a longitudinal data set. The mean time of exposure to the program was 14 mo (12).

Data collection. Data were collected by experienced fieldworkers who were trained extensively. The training included classroom and field exercises. To avoid potential interviewer bias, fieldworkers were, to the extent possible, unaware of the group assignment. Both at baseline and follow-up, food consumption data were collected as well as socioeconomic data. Household food consumption data were obtained by asking homemakers (generally the mother of the study child) or the person responsible for home food purchases and/or preparations: "In the last 7 d, how many days was …. consumed in this household" And "In the last 7 d, how much did you consume of …." This was asked with respect to 61 most-often±consumed foods in Mexico. Food consumption was defined as the foods used in the household for the preparation of meals irrespective of whether they were purchased, home produced, or received as a gift or as part of the food basket. For foods consumed outside of the house, only expenditure data were collected. Analyses indicated that 90% of the households reported zero expenditure for this item.

In each household, written informed consent for participation was obtained from the mother or the self-identified decision maker. The protocols governing the data collection were approved by the Research, Biosafety and Ethics Commissions of the National Institute of Public Health in Mexico.

Data analysis. Because of their skewed distribution, all dependent variables were log-transformed. The baseline characteristics of the households in the treatment groups were compared.

To assess the impact of PAL on household consumption, we first estimated the program's impact on total energy consumption and energy consumption in 4 food groups: fruits and vegetables, grains and legumes, animal-source foods, and processed foods. The processed foods category included foods such as vegetable oil, alcoholic beverages, soda, chips, cookies, candy, sugar, coffee, chocolate, and mayonnaise. We also estimated the program's impact on household consumption of protein, fat, a number of micronutrients (heme and nonheme iron, zinc, vitamin C, and retinol equivalents), and fiber. Energy and nutrient consumption was calculated by multiplying the reported quantities for each food item by its respective nutrient composition, which was obtained from food composition tables compiled and adapted for Mexican foods by the National Institute of Public Health, taking into account the edible fraction (16). Energy and nutrient consumption were calculated per day per adult equivalent (AE). AE were used to allow the comparability of households of different sizes and demographic composition. The AE was calculated by dividing each individual's age- and sex-specific recommended energy intake by the average recommended energy intake for an adult (2694 kcal or 11,271 kJ) (17). Body weight was not taken into account, because it was not available for all household members. The number of AE for the household was computed as the sum of all of the individual AE. The AE were calculated based on the household roster data. Additional analyses were conducted by adjusting the analyses for visitors and meals consumed outside the home. Because these results were not noticeably different, the results based on the household roster are reported.

The analyses were restricted to households within sample percentiles 2.5 and 97.5 of each of the outcome variables to minimize the effect of extreme values. To estimate the impact of the program, we used a double difference model, an analytic approach commonly used in impact evaluation studies [e.g. (18±20)]. The following model was estimated:

$$\log(consumption)_{i,t=0,1} = \alpha_0 + \alpha_1 \cdot time + \alpha_2 \cdot treatment + \alpha_3 \cdot time \times treatment + \alpha_4 \cdot household + \alpha_5 \cdot state \times time + \alpha_6 \cdot month + \alpha_7 \cdot \log(adult\ equivalent) + \varepsilon$$

where time is baseline or follow-up, treatment is the type of treatment received, household is a household fixed effect, state x time is the interaction term between state in which the household is located, and time, month is the month in which the data were collected and adult equivalent is the number of AE in the household.

The coefficient α_3 represents the estimated treatment effect of the program as the percent change with respect to the baseline consumption. By using household fixed effects, the model controls for unobserved household characteristics that did not change between baseline and follow-up. Additionally, the fixed effects control for the possibility of differential changes in prices (i.e. inflation) across communities. The state x time interaction was added to control for possible state-specific changes over time that could have affected the results (such as changes in policies, prices, etc.). The month of data collection was included to adjust for the possible effect of seasonality on consumption. We included adult equivalent to control for changes in the number of AE between baseline and follow-up. After estimating the model, the impact coefficient (α_3) was multiplied by the median consumption at baseline to calculate the absolute change in the outcome variables. We conducted intent-to-treat analyses. All models were estimated using Stata (StataCorp, version 9.2).

Based on preliminary analyses and program information, we decided to merge the 2 food basket groups. The education component in the group that was supposed to receive education was delivered irregularly and was in general of low quality (21). Second, a number of communities in the food basket group without education set up education sessions themselves when they found out about the program's education component (22). Finally, the program impact on consumption between both food basket groups did not significantly differ (results not shown).

Results

Full data were available for 5823 households or 87.0% of those surveyed at baseline (Supplemental Table 1). This percentage was slightly lower in the control group (83.1%) than in the treatment groups (88.3%).

At baseline, ~40% of the household heads had completed primary school. Families lived in homes with an average of fewer than 3 rooms. The mean number of AE per household was ~4. The value of mean household per AE consumption at baseline was ~571 pesos/mo, 61% of which was spent on food (Table 2). The major sources of energy consumption were cereals and legumes. Only a very small fraction (1%) of total iron consumption was heme iron. Control and treatments groups did not differ at baseline, except for vitamin C, where the food basket group had lower consumption than the control group ($P < 0.05$). No significant differences were found between treatment groups.

PAL increased energy consumption ($P < 0.01$; **Table 3**) in both treatment groups. The largest relative changes were found in energy consumption from fruits and vegetables and from animal-source foods. Compared with the cash group, the effect in the food basket group was higher for total energy, energy from animal-source foods, and energy from cereals and legumes ($P < 0.05$).

PAL increased the consumption of all macro- and micronutrients ($P < 0.05$; Table 3) with the exception of heme iron in the cash group. The effect on total iron consumption was almost entirely attributable to the increase in nonheme iron. The largest program impact was found for the consumption of vitamins A and C. Effects were greater in the food basket group than in the cash group ($P < 0.05$) except for fiber, which did not differ.

Discussion

Using a randomized controlled trial, we showed that the impact of the PAL on household diet was not unequivocally healthy. A positive effect was found on fruit and vegetable consumption, which was also reflected in the increased consumption of vitamins A and C and fiber. Fruit and vegetable consumption has been associated with lowered risk of obesity and cardiovascular disease and might lower the risk of diabetes (23). The program also increased the consumption of iron and zinc. The percentage increase in most nutrients was found to be greater than the increase in energy consumption, pointing to an increase in the nutrient density of the household diet. The significant increase in household energy consumption, however, is of concern. With respect to the second study objective, we found that the food basket led to a significantly greater impact on energy and nutrient consump-

Table 2. Baseline characteristics of households in the control, food basket, and cash groups[1]

Characteristic	Control	Food basket	Cash
n	1384	2947	1492
Per AE household consumption (monetary value, monthly)2			
Total, *pesos*	571.3 ± 352.3	541.3 ± 345.4	551.6 ± 336.5
Nonfood consumption, *pesos*	217.9 ± 198.0	206.9 ± 195.5	216.8 ± 196.2
Food consumption, *pesos*	347.7 ± 204.6	329.9 ± 194.5	330.4 ± 190.2
Per AE household nutrient consumption (daily)[2]			
Total energy,[3] *kcal*	2702.0 ± 1140.3	2741.0 ± 1162.4	2776.8 ± 1172.2
Energy from fruits and vegetables	81.8 ± 73.6	72.6 ± 67.9	79.7 ± 70.5
Energy from cereals and legumes	1625.3 ± 838.9	1679.6 ± 900	1723.7 ± 916.5
Energy from animal source food	278.1 ± 229.6	272.4 ± 228.6	261.7 ± 214.0
Energy from processed food	655.9 ± 356.6	658.6 ± 348.7	664.0 ± 344.1
Carbohydrates, *g*	450.3 ± 200.3	461.3 ± 210.3	466.7 ± 215.3
Proteins, *g*	70.4 ± 31.6	70.1 ± 31.4	71.7 ± 32.7
Fat, *g*	73.0 ± 36.7	72.3 ± 35.5	74.7 ± 35.3
Fiber, *g*	44.0 ± 21.3	45.1 ± 22.4	46.2 ± 22.9
Total iron, *mg*	19.5 ± 9.9	20.3 ± 10.3	20.6 ± 10.8
Heme iron, *mg*	0.2 ± 0.2	0.2 ± 0.2	0.2 ± 0.2
Zinc, *mg*	11.0 ± 5.4	11.3 ± 5.6	11.4 ± 5.8
Vitamin A, retinol equivalents	410.4 ± 334.4	384.5 ± 326.0	403.5 ± 346.4
Vitamin C, *mg*	85.8 ± 76.4a	73.6 ± 68.4a	81.5 ± 70.5

1 Values are means ± SD. [a] Treatment groups differ, $P < 0.05$.
2 Extreme observations (bottom and top 2.5% tails) excluded.
3 1 kcal = 4.184kJ.

tion than the cash transfer. The large difference between groups in the impact on energy consumption from cereals and legumes was most likely due to the fact that the food basket contained relatively large quantities of grains and legumes.

The proportionally greater impact on energy consumption from animal-source foods and fruits and vegetables is consistent with other conditional transfer programs in Mexico, Nicaragua, and Colombia. Overall energy consumption increased by 3.6% in Oportunidades, the Mexican program, and greater effects were found for energy from fruits and vegetables (12.3%) and animal-source foods (12.5%) (9). In Nicaragua, the impact on total energy consumption was not significant ($P < 0.10$); the impact on energy from fruits and vegetables and animal foods was 52.5 and 62%, respectively (9). In Colombia, food expenditure increased by 15.7% and expenditure on animal foods by 20%; no significant impact on fruit and vegetable expenditure was found (5).

We are unaware of any randomized trial that has evaluated the impact of cash and in-kind transfers on household energy and nutrient consumption. A potential source of selection bias are the households excluded from the analyses due to missing values or because they did not participate in the follow-up (13% of the original sample). Households excluded from the analyses tended

Table 3. Impact of the PAL on household per daily energy and nutrition consumption

Outcome	All foods	
	Food baket[1]	Cash[1]
Energy		
Total, *kcal*[2]	0.091 ± 0.017**a[226.7]	0.050 ± 0.019*a[126.9]
From fruits and vegetables	0.278 ± 0.041** [14.2]	0.236 ± 0.048** [13.8]
From cereals and legumes	0.101 ± 0.021**a[146.7]	0.042 ± 0.025a[63.6]
From animal source food	0.387 ± 0.039**a[79.9]	0.240 ± 0.045**a[50.0]
From processed food	0.067 ± 0.021** [39.8]	0.052 ± 0.024* [31.5]
Nutrients		
Carbohydrates, *g*	0.087 ± 0.018** [36.1]	0.057 ± 0.021** [23.9]
Proteins, *g*	0.134 ± 0.018**a[8.6]	0.076 ± 0.021**a[4.8]
Total fat, *g*	0.152 ± 0.019**a[9.9]	0.074 ± 0.022**a[5.0]
Total fiber, *g*	0.082 ± 0.019** [3.3]	0.054 ± 0.023* [2.2]
Total iron, *mg*	0.187 ± 0.020**a[3.3]	0.055 ± 0.023*a [1.0]
Heme iron	0.217 ± 0.053**a[0.0]	0.084 ± 0.062a [0.0]
Zinc, *mg*	0.221 ± 0.02**a [2.2]	0.092 ± 0.023**a[0.9]
Vitamin A, retinol equivalents	0.418 ± 0.032**a[120.9]	0.217 ± 0.038**a[64.0]
Vitamin C, *mg*	0.528 ± 0.037**a[27.5]	0.309 ± 0.043**a[18.9]

1 Values are regression coefficients ± SE [absolute change per day per AE], $n = 5412$ to 5790. The impact was estimated using a double difference household fixed effect model, controlling for state × time interaction, survey month, and the number of AE in the household. Asterisks indicate different from control households: *$P < 0.05$, **$P < 0.01$. [a] Treatment groups differ, $P < 0.05$.

2 1 kcal = 4.184 kJ.

to live in smaller houses than those included (2.48 vs. 2.77 rooms; P < 0.05). Nutrient consumption at baseline was higher in excluded households, but differed (P < 0.05) for <5% of the variables. We believe that is unlikely that our results suffer from selection bias.

Another potential limitation of the study is the use of a household consumption module for our nutrition analyses (24). An obvious disadvantage of the consumption module is that it relies on a longer recall period (7 d) than dietary assessment techniques such as a 24-h recall. To help the respondents, however, they were first asked about the number of days each food was consumed. We also used an extensive list of foods to assist the respondents' memory. No detailed data were collected for foods consumed outside the household, but only 10% of households reported expenditures in this category. It is thus unlikely that this omission would have biased our results. Notwithstanding these caveats, baseline per AE consumption was in the expected range for all nutrients. Additionally, it must be noted that the double difference approach cancelled out any measurement error that was constant over time (25).

The use of household consumption, which does not provide information on how the additional nutrients were distributed within the household, could be considered a limitation of this study. Analysis of the 24-h recall data collected in children 1±4 y of age and mothers of underfives showed that the proportional increase in the consumption of iron and Zn was similar to the increase found at the household level (12). There is thus no evidence of intra-household discrimination. The anthropometric data collected in the context of this program showed no indication of energy deficiency in these communities. The mean weight-for-height Z-score in children <5 y of age

was 0.40 SD; the prevalence of overweight and obesity (BMI >25 kg/m2) in adult women was 63.2%. The large increase in household energy consumption should thus be considered as negative for both groups. Studies are currently underway to explore to what extent the PAL led to excess energy intake of individuals.

The randomized design and the use of longitudinal data are important strengths of this study. The difference-in-difference approach we used controls for the effects of unobserved time-invariant differences between households in the different groups. The household fixed effects in the model provided a control for differential inflation (and other changes) between communities and treatment groups over time.

The food basket led to a significantly greater impact on energy and nutrient consumption than the cash transfer. One possible reason is that the local value of the food basket was an estimated 30% higher than the cost to the program and thus to the value of the cash transfer. Additionally, the larger impact in the cash group is consistent with a large body of empirical evidence that in-kind transfers increase food consumption by more than receiving the equivalent amount in cash. Both nonexperimental [e.g. (26)] and experimental studies [e.g. (27)] have shown that the marginal propensity to purchase food out of cash income is significantly lower than out of food.

A key question raised by our findings is *why* households increased energy consumption when the diet at baseline was not deficient in energy. This finding is unlikely to be due to reporting bias, because there is no reason to think that households in the treatment group would have systematically overreported consumption compared with the control group. Based on economic theory, one would expect households who have covered their energy needs to substitute quality and variety for quantity and energy (28). A number of nutrition studies conducted in developed countries, however, have shown that larger portions served or large food quantities available increase nonvoluntary consumption (29), even if the served food did not taste good (30). Food consumption is not regulated solely by physiological needs; food availability, as well as environmental and social cues, have a powerful influence on the amount of food consumed (29,31,32). It has been postulated that eating is an automatic behavior more influenced by environmental cues, such as food availability and visibility or the ease of obtaining foods, than by self-regulation of intake (33). These findings have important implications for (food) transfer programs that are built on the assumption that beneficiaries will consume the food they need and use the leftover resources for nonfood consumption or savings. Given the popularity of (conditional) transfer programs, our results call for further exploration of the mechanism underlying the preference for energy. Future studies should explore the psychological, physiological, and cultural determinants of households' choice for quantity vs. quality.

Skoufias et al. (34) showed that the PAL program reduced poverty. We found that this program increased the consumption of fruits and vegetables and animal-source foods, the nutrient density of the household diet, and the consumption of fiber, zinc, iron, and vitamins A and C. While having these positive effects, it also significantly increased household energy consumption. This is an alarming finding given that 60% of adult women were overweight or obese at baseline; the estimated national prevalence is 72% of women and 67% of men (10). Although programs aimed at alleviating poverty are necessary in Mexico, our findings indicate the need to use extreme caution when providing households with cash or food transfers. These programs should not be implemented without an effective behavior change communication component. This component would help households understand the importance of healthy micronutrient-dense diets and should finally result in changed household consumption. Specific attention would need to be paid to the risk of increasing the consumption of energy-dense foods as a result of the intervention.

In designing the food basket, the PAL program complied with the Mexican norm for food aid (15). Our results would support a call for revision of this Mexican norm. It should be based on micronutrient rather macronutrient requirements. In redesigning the intervention, the program should also evaluate the appropriateness of the use of the Liconsa milk. In additional analyses, we removed the milk from the household food consumption data. Even though a formal test of the impact of Liconsa would require a study comparing households receiving a food basket with and without the fortified milk, these analyses provide some interesting results. We found that most of the differences between groups disappeared when Liconsa was removed from the analyses. This suggests that Liconsa may contribute significantly to the impact on both energy and micronutrient consumption. The impact on the consumption of iron and Zn in the food basket group appeared to be almost entirely attributable to the consumption of Liconsa. Fortified whole milk may thus not be the best vehicle to improve micronutrient intake in this population. The use of low-fat milk (which was started in

2008 by the Liconsa program) or the use of micronutrient supplements not containing energy, such as micronutrient sprinkles, should be considered as alternatives in this program. The decision about the use of Liconsa also needs to take into account the nutritional benefits of the high quality protein in the milk and the well-documented positive effect on child linear growth (35).

The presented findings are important for the PAL program but are also relevant for other transfer programs given that many of these are implemented in countries with nutrition problems similar to those in Mexico. These programs should be carefully reviewed to make sure that raising people out of poverty is not at the expense of increasing their energy consumption and hence leading to overweight and obesity. The available evidence from CCT programs suggests that these programs have a positive impact on household diet. Our analyses indicate that the effect is not unequivocally healthy. This highlights the importance of not only evaluating these programs with respect to the monetary or energy value of consumption but also in terms of nutrient composition.

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T.G. designed the research; T.G. and S.R. conducted the research; J.L. and P.G. analyzed the data and wrote the paper. J.L. had primary responsibility for final content. All authors read and approved the final manuscript.

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Patterns of medical employment: a survey of imbalances in urban Mexico*

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Among the many paradoxes of contemporary health systems probably none is so indicative of failure as the coexistence of underemployed physicians with underserved populations. This is the situation that today prevails in many countries of the world.[1] For reasons that are not yet fully understood, a wide variety of nations, with very different levels of economic development and political structures,[2] experienced during the last decades substantial increases in the supply of physicians, which the health system was often unable to absorb.[3] The result has been the appearance of manpower imbalances that have assumed manifold manifestations."[4] In order to contribute to our understanding of the dynamics of medical employment, the present article analyzes the case of physicians in the urban areas of Mexico. Apart from the intrinsic interest of the subject, the Mexican health care system offers the analytical advantage of encompassing virtually all organizational forms of medical work, from independent practice to salaried jobs in the public sector; extreme forms of imbalances such as underemployment and unemployment exist The conceptual framework and specific methodology we have developed may be relevant to other nations.

Overview: The Medical Labor Market in Mexico

From the establishment of the first course of medicine in 1578 until the beginning of the 1970s, Mexico suffered from a chronic shortage of physicians. Starting in 1967, however, the medical education system experienced an explosive expansion. Student enrollment peaked in 1980 at 93,365, compared to 28,731 in 1970;[5] the number of medical schools reached 56 in 1979, up from 27 in 1970.[6] The underlying causes for this growth process are very complex and have been analyzed in detail elsewhere.[⊠] Briefly, two factors appear to be crucial: the increased demand for higher education from the middle classes, and the effects of the economic crisis that has intermittently affected Mexico since the mid-1970s and has channeled a large number of young people who cannot find employment in the general labor market into the universities.

The economic crisis also produced a reduced rate of growth of medical services, which made it impossible for the health care system to absorb the increased number of graduates. As a consequence, new phenomena of un- and underemployment began to characterize the medical labor market. Table 1 indicates that the supply

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Table 1. Recent Evolution of Physician Supply in Mexico

Year	Absolute number of Physicians	Physicians per 100,000 population
1960	20,590	57
1970	34,107	71
1985	120,000	153

Sources:
For 1960:Ref.7
For1970:Ref. 8
For 1985: Ref. 9

of doctors in Mexico grew 2.7 times between 1960 and 1985.[7-9] It has been estimated that until 1971 every physician could find a salaried position upon graduation; by 1984 four graduates had to compete for every job in a health care organization.[10]

In addition, the number of positions for postgraduate residencies has remained practically constant throughout this period, at about 2,000 new positions per year. This means that the point of selection has been transferred from the medical school to the specialty residency, where entry is regulated by a uniform national examination, so that the competition for such positions has become fierce.

Since 1979 there has been a sustained effort to curb the growth of the medical education system, mostly through the institution of a joint decision-making body that brings together representatives from both the universities and the health sector.[11] As a result, only three new medical schools have been created in the past 10 years, and the annual number of graduates, which peaked at 14,099 in 1983, has declined steadily.[5] Nevertheless, the momentum of the physician population that was produced by the high growth rates of the 1970s explains *why* unemployment and underemployment have remained high.

Despite their visibility in the media, the magnitude of these imbalances has not been quantified with precision up to now. Estimates vary widely according to the interests represented by each source. In order to provide a scientifically validated picture of the employment situation of doctors, we conducted a national survey in 1986. Apart from its descriptive purpose, the survey also had the objective of exploring variables that may account for the performance of physicians in the labor market.

Methods

Data Source

Because the purpose of the study was to analyze the full range of employment possibilities, including the lack of a stable job, it was obvious that we could not draw a sample of traditional sites of medical work, such as offices and hospitals. Instead, we needed a representative sample of households where those holding a medical degree lived.

Such a sample was obtained from the 41,000 households that are visited every three months by the National Survey of Urban Employment, which is the official source of most labor statistics in Mexico and is carried out by the National Institute of Statistics, Geography, and Informatics. This survey covers the 12 metropolitan areas in the country and the four most important cities on the United States- Mexico border. It is a rotating panel survey, based on a stratified, multistage sample of households, where 88,050 people, representing 14,529,826 inhabitants ages 20 years or more, are interviewed. The validity and reliability of this survey have been extensively documented throughout the 17 years during which it has been in existence. Further details can be consulted in official publications on the survey.* Although this is a complex probability sample,[12] physicians constitute a relatively rare element in it; under these circumstances we assumed that they behave as a simple random sample, so that No weighting of the data is necessary in the analysis.[13]

In the last trimester of 1985,620 physicians were identified during the regular round of the National Survey of Urban Employment. Shortly thereafter, these doctors were reinterviewed in face-to-face sessions by professional interviewers, who used a questionnaire specifically designed for our study at the National Institute of Public Health. The entire process of interviewing and coding was supervised by researchers from this institute.

Complete questionnaires were obtained from 604 physicians, for an overall response rate of 97 percent, which ranged from 94 percent in one city to 100 percent in eight cities. In Mexico future physicians are required, after four years of medical school, to complete a one-year internship in a hospital and one additional year of "social service" in a rural area before receiving their medical de-

* Instituto Nacional de Estadistica, Geografi'a e Infomiatica: Encuesta Nacional de Empleo Urbano: Diseno Muestral. Aguascalientes, Mexico, December 1987.

grees. The sample included these interns and social service practitioners in addition to physicians who had already obtained their degrees. However, the present analysis is based on the 491 physicians who were active in the labor market. The "inactive" doctors excluded from the analysis comprise retired persons, as well as interns and social service practitioners, who do not demand employment since they are assured those positions in order to comply with the requirements for a medical degree.

Variables

Social Origin. This reflects not only the general standard of living that the physician enjoyed while he/she was growing up, but also the access to networks of relationships that may create future job opportunities. Social origin was measured through an index based on the occupation of the person who supported the physician during his/her years as a medical student (typically the father). The resulting categories were: low (e.g. manual workers, small-scale merchants), middle (e.g. technicians, teachers, clerical workers, foremen, sales agents, mid-sized merchants), and high (e.g. owners of industry, senior managers, senior government officials, professionals). In order to validate this index, we used the 1980 Census data to rank occupations along an income scale that was divided into three equal parts. The data on fathers' occupations from our survey were then matched to the Census occupation information. There was 100 percent match between our three categories of social origin and the three segments of the income scale.

Gender. Apart from its effects on productivity and job stability, gender is thought to be associated with differential access to occupational positions even after educational opportunities have become more equal among women and men.

Medical School Quality. It cannot be assumed that attending a medical school represents the same educational experience for everyone. The only objective indicator of quality available for all medical schools in Mexico is a standard examination applied to graduates at the end of their studies in order to select those who will be admitted into a residency. However, this standard test has only been in existence since the mid-1970s, so that no comparable quantitative data are available for physicians who studied earlier. For this reason, we measured quality through an opinion poll from 30 experts in medical education selected to represent four groups: authorities from medical schools, decision makers from the main health institutions in charge of medical manpower, faculty members from medical schools, and academics who have studied various aspects of medical education. Experts were given a standardized schedule to rate the quality of schools, taking into consideration elements of structure (e.g. number and qualifications of the faculty, adequacy of the facilities), process (e.g. type of curriculum, educational methodology), and outcomes (e.g. competence of graduates, success in finding jobs). They were asked to provide separate evaluations for two time periods: before and after 1970, since it cannot be assumed that the quality of the schools existing before 1970 has remained constant. Evaluations for each school in each time period were made on a scale from 1 to 4, and the scores were weighted according to the amount of information that the experts declared themselves to have about each assessment. The quality index was the average of these weighted scores. Its distribution revealed two marked cleavages, which were used as cutoff points to stratify schools into three categories of quality: inadequate, average, and good. The validity of the quality index for schools after 1971 was checked by correlating it with the average scores of graduates from each school on the standard examination for admission into residencies. The Pearson r correlation was 0.76, which was considered satisfactory.

Type of Specialty. This variable reflects the differential access to opportunities for postgraduate education. It also indicates the intensity of specialization, as measured through the following categories: no specialty, family medicine, basic specialties (i.e. internal medicine, pediatrics, gynecology-obstetrics, and general surgery), and subspecialties. Even though in Mexico the length of postgraduate training is similar for family medicine and for the basic specialties, the former is considered to represent a lower degree of specialization, since family practitioners are trained to deal with all age and sex groups. In addition, the practice settings are also different. Family medicine emerged during the 1970s as a residency program aimed at satisfying the requirements for first-contact care at the social security and other public-sector organizations. Thus, family doctors practice almost exclusively in ambulatory settings, while basic specialists also work in general hospitals.

Generation. To consider the influence of contextual variables, such as the situation of the medical labor market, we measured a variable called generation, which refers to the year in which the physician entered medical school,

whether before or after 1971, the year when the policy of massive access to higher education was fully implemented. In addition to reflecting the environment to which the physician was exposed during his/her formative years, generation is very highly correlated (Pearson's r = 0.97) with age. In turn, age is related to experience, productivity, and exposure to employment opportunities, all of which affect the success of a physician in obtaining a desirable job.

Even though the data come from a cross-sectional survey, the fact that there is an unambiguous chronological order among the variables allows us to adopt a "biographical" view of medical employment. In this time order, three of our independent variables can be considered antecedent to the others, i.e. social origin, gender, and generation/age. In turn, attending a medical school occurs before postgraduate training to become a specialist. The final link in this chain, which represents the dependent variable, is medical employment.

Dependent Variable We conceptualize the dependent variable as "medical employment pattern," built through cluster analysis of physicians sharing similar job characteristics. The detailed statistical procedure has been described elsewhere.[14] The final variable summarizes the most relevant dimensions of employment: number of jobs; position (salaried or independent); occupational level (whether the job requires less skill than what the person was trained for, e.g. whether the physician performs a nonmedical job); productivity (measured by the number of patients seen and hours worked per week); income; and job stability. Obviously, the number of potential combinations is very large. Cluster analysis enabled us to ascertain the specific combinations that occur empirically. These combinations were grouped to form the dominant patterns, which turned out to be six:

1. *Unemployment:* This category was strictly defined to include those doctors who did nothing but search for a job or who had stopped looking for one because they had become discouraged.
2. *Qualitative Underemployment:* This pattern refers to physicians who worked outside medicine. Even if they may have had high productivity or income, the social investment in their medical education would have been underutilized. As it turned out, most of these jobs required a lower level of training than medical care.
3. *Quantitative Underemployment:* Our analysis identified a cluster formed by physicians who provided patient care, but did so under one or more negative circumstances suggesting that their work potential was severely underutilized.[15] As shown in Table 2, doctors in this cluster saw very few patients (the mean for the cluster was 18.2 patients per week, compared to 66.1 among all other physicians in patient care), worked reduced hours (a mean of 31.9 hours, compared to 55.3 among the rest of physicians, with 60 percent of underemployed doctors working less than 35 hours per week), and/or earned a low income (54 percent made less than three minimum wages, compared to 18 percent among fully employed doctors). In addition, these physicians tended to have unstable working conditions, characterized by job insecurity and high turnover rates.
4. *Salaried Single Medical Employment:* This is a conventional pattern composed of doctors with one stable salaried job in a health care organization, most often in the public sector.

Table 2. Average Productivity and income for Medical Employment Pattems Involving Care

Medical Employment Pattems Involving Patient Care	Productivity		Income	
	Mean number of patients seen per week	Mean number of hours worked per week	Percentage eaming less than 3 minimum wages %	Percentage eaming more than 5 minimum wages %
Salaried single emptoyment	65.4	60.1	25	35
Independent single employment	27.9	36.7	24	53
Multipie emptoyment	83.8	57.1	5	84
Quantitative underemployment	18.2	31.9	54	19

5. *Independent Single Medical Employment:* This cluster represents another conventional pattern, wherein physicians work full time in their own private practices. In terms of income, this was a more heterogeneous cluster than the previous one; as shown in Table 2, the percentages in the lower end of the distribution were similar among both clusters with single employment, but independent doctors exhibited a much higher proportion of high income earners. Such heterogeneity also accounts for the smaller average productivity, since competition probably forces some independent physicians into the lower end of the distribution.
6. *Multiple Medical Employment:* This last pattern included cases holding two or more medical positions, the majority of them with one salaried and one independent job. In the Mexican medical labor market, as in many other developing countries, such a dual pattern has been traditionally considered to be very desirable, since it allows the physician to combine the prestige of a position in a public hospital with the economic incentives of a private practice. The advantages of this situation can be appreciated in the productivity and income figures presented in Table 2.

Analysis

The purposes of the analysis were to measure the frequency of each medical employment pattern, to determine the links among the variables, and to compare the relative strength of each relationship. In order to achieve this last purpose, we used percentage differences, as well as two conventional measures of association for cross-tabulations, namely, Cramer's V when the measurement level of the variables was nominal and Gamma when it was ordinal.[16-18]

Results

Table 3 presents a set of cross-tabulations between pairs of variables. The marginal totals provide the frequency distribution of employment patterns, and the percentages can be interpreted as employment rates. Thus, the unemployment rate is 7 percent, while the global underemployment rate (quantitative and qualitative) is 22 percent. Projecting these proportions, we can infer from the population of active physicians in the 16 cities (81,024) that un- and underemployment affect approximately 23,500 doctors.

Moving to the correlates of this problem. Table 3 indicates that all the explanatory variables, except social origin, exhibit significant and fairly strong overall associations with employment pattern. Beyond these common characteristics, it is worthwhile to examine each cross-tabulation.

Generation

Table 3 shows a marked increase in unemployment and underemployment from the oldest to the youngest group. Among those who do have a job, there is a shift from independent to salaried practice and from multiple to single employment. This variable reflects not only the intrinsic differences between the two generations, but also the different time spans that each group has been in the labor market. In addition, the sample may be biased for the older generation insofar as we only have the survivors. Nevertheless, the trends exhibited by our data are consistent with existing information about the supply and demand of physician manpower.

Gender

There is an important connection between generation and gender, since the proportion of women among physicians was 14 percent in the 1920-70 generation and 26 percent in 1971-86. As can be seen in Table 3, the proportion of unemployed women is three times higher than the corresponding figure for men. Although salaried single employment is the most important pattern for both groups, the second most important pattern is multiple employment among men and unemployment among women.

Social Origin

There is a tendency for multiple medical employment to be more frequent with higher social origin. Conversely, salaried single employment is not as important in the high group as it is in the other two, and unemployment is most frequent among physicians from the lowest socioeconomic background.

Medical School Quality

There is a marked descending gradient for the least desirable patterns as quality increases: 47 percent of physicians who studied at an inadequate school are un- or underemployed, compared to 24 percent and 17 percent of graduates from average and good schools, respectively. It is also worth noting that higher quality is associated with increasing proportions of multiple medical employment. This is the dominant pattern for physicians from the better

Table 3. Relationships between Medical Empioyment Pattern and Each of the independent Variables

Medical employment	Independent Variables															
	Generation		Gerder		Social Origin			Medical School Quality				Type of Specialty			Total	
	1920-70 %	1971-82 %	Male %	Female %	Low %	Middle %	High %	Inadequate %	Average %	Good %	Without specialty %	Family medicine %	Basic Specialties %	Sub Specialties %	%	N
Salaried single employment	27	41	32	45	37	38	25	33	38	32	25	83	37	39	34	169
Independent single employment	16	7	13	4	11	11	12	11	11	11	15	0	5	11	11	55
Multiple employment	42	10	30	9	20	27	33	9	27	40	14	15	48	41	26	126
Quantitative underemployment	6	15	9	15	10	11	12	18	9	6	15	0	8	5	11	52
Qualitative underemployment	7	14	11	10	11	9	11	14	10	9	18	2	1	3	11	52
Unemployment	2	13	5	17	11	4	7	15	5	2	13	0	1	1	7	37
Total %	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	
N	235	256	391	100	197	180	114	158	166	167	262	41	89	99	491	
X^2	98.5		40.8		16.9			65.4				159.4				
P	0.0001		0.0001		0.0759			0.0001				0.0001				
Cramer´s V	0.45		0.29		0.13			0.26				0.32				

schools, whereas salaried single employment is the most common pattern for inadequate and average schools.

Type of Specialty

Lack of postgraduate training greatly increases the chances of un- or underemployment: almost half of the physicians without a specialty are located in one of these categories. The practice of family medicine has become the prototype of medical work based on a single salary at the service of the state, with 83 percent of family doctors exhibiting such a pattern. The traditional pattern of multiple employment is now reserved for physicians with a basic specialty or a subspecialty, among whom unemployment is very rare.

Some of the effects shown in Table 3 could be indirect, as mediated by chronologically subsequent variables. In the case of gender, there were no significant differences between men and women in the quality of the medical school attended, but their respective opportunities for postgraduate training presented sharp contrasts. Thus, when specialty is examined by sex, we find that more than two-thirds of female doctors have no specialty, compared to less than half of their male colleagues (Table 4). Among those who do complete a residency, the proportions of men and women are about equal in family medicine. However, males dominate in the basic specialties and even more so in the subspecialties, where their proportion is twice that of females.

Social origin could also affect employment indirectly, through a relationship that is mediated by medical school. As shown in Table 5, the association between social origin and medical school is fairly strong. Thus, 40 percent of physicians from the lower social origin attended an inade-

Table 4. Type of specialty by gender

Type of specialty	Gender	
	Female %	Male %
Without specialty	69	49
Family medicine	9	6
Basic specialties	11	20
Subspecialties	11	23
Total	100	100
N	100	391

$X^2 = 17.22$ p = 0.0018 Gamma = 0.24

Table 5. Quaiity of the medical school attended, by social origin of the physician

Medical school quality	Social origin		
	Low %	Middle %	High %
Inadequate	40	28	25
Average	36	34	31
Good	24	38	44
Total	100	100	100
N	197	180	114

$X^2 = 17.22$ p = 0.0018 Gamma = 0.24

quate medical school, compared with 44 percent of doctors from the higher social origin who went to a good school.

Part of the effect of medical school quality on employment may be mediated by type of specialty, since entrance to a residency is a competitive process that is bound to be affected by the quality of previous education. Table 6 demonstrates that there is a strong association between medical school quality and type of specialty. The likelihood of having no specialty increases consistently as quality decreases. Thus, the proportion of general practitioners is 1.4 and 2.2 times larger among graduates of inadequate schools than among doctors who studied at average or good schools, respectively. In contrast, good schools concentrate the highest proportions of basic specialists and subspecialists. In fact, we can consider the high degree of consistency of this association as a confirmation of the validity of our measure of school quality.

Table 6. Type of specialty, by quality of the medical school attended

Type of Specialty	Medical School Quality		
	Inadequate %	Average %	Good %
Without specialty	75	52	34
Family medicine	6	9	9
Basic specialties	10	19	26
Subspecialties	9	20	31
Total	100	100	100
N	158	166	167

X2 = 58.97 p = 0.0001 Gamma = 0.45

Discussion

The results of this study point to a series of imbalances, inadequacies, and inequities that characterize the medical labor market in Mexico. First of all, the heavy burden on Mexican society: almost one-third of all physicians living in the 16 major cities are unemployed or underemployed. Because these extreme forms of imbalance are likely to be concentrated in the large cities, the situation probably approaches the total for the whole country. In any event, the figure of 23,500 unemployed and underemployed physicians acquires its precise meaning when one considers that in 1986, the year when our survey was conducted, 9.3 million people, representing 11 percent of the Mexican population, did not have ready access to health services.[19]

Not all types of imbalance produce the same social impact. Unemployment and qualitative underemployment represent a waste of resources for society and a source of frustration for those doctors who have to work outside medicine or cannot find a job at all. Paradoxically, even those who are unemployed seem unwilling to serve in deprived rural areas, indicating that they would rather remain in the cities than be fully employed as physicians where their services are most needed.[20]

While unemployment and qualitative underemployment are undoubtedly severe problems, quantitative underemployement opens up a new perspective on physician

oversupply. In this case, doctors still provide patient care, but do so at low levels of productivity. It is not unreasonable to assume that such doctors may represent a potential risk to their patients. Our analysis indicates that physicians with low output tend to be young, have no postgraduate training, and often work in independent practices without any supervision. Under these circumstances, the quality of care may suffer through two mechanisms: first, doctors who see few patients may be unable to build up enough clinical experience; second, there may be a tendency to overprescribe medical procedures in order to derive a living from those few patients. The extent to which quantitative underemployment of doctors may represent a health risk is a subject for future research.

The appearance of imbalances also suggests that the medical labor market is experiencing a process of segmentation.[21] Apart from those physicians who are out of a medical job, there seem to be two major segments. The first one is characterized by reasonable productivity, relatively sufficient earnings, and stable employment conditions through a salaried position in government, a conventional private practice, or both. Diverging from the mainstream, a substantial number of doctors have entered into a marginal segment of the market, which is characterized by low productivity, insufficient earnings, and occupational instability. The segmentation process even extends to those who have attained relatively good positions, as illustrated by the fact that the traditional prestigious pattern of combining a salaried position in the public sector with a private practice is now dominated by physicians with a basic specialty or a subspecialty; in contrast, family doctors exemplify a new kind of medical functionary, since the vast majority of them hold their only job at the service of the government.

These cleavages in the medical profession reflect a broader process leading the medical education and health care systems to reproduce, rather than ameliorate, preexisting social inequalities. Such a process begins with the channeling of students from different social origins to medical schools of varying quality. Indeed, the data reported here have demonstrated that there is a substantial degree of social stratification among medical schools, thus corroborating the findings from a previous study.[22] In tum, the quality of the medical school affects the probability of doing a specialty residency, which has a direct effect on employment. To complete this logic, we can assume that underemployed physicians are more likely to care for people from the lower social classes. There are reasons to believe that the quality of the care provided by these physicians is inadequate. In addition, there is empirical evidence that the distribution of the quality of care in Mexico is highly stratified by social class.[23] A circle is therefore closed: disadvantaged people will attend substandard medical schools and end up providing inferior care for other disadvantaged people. Obviously, this is not a deterministic but a probabilistic sequence of events. Indeed, we are not dealing with a rigid social structure that prescribes these patterns of behavior, but with one that tends to reproduce inequality. Although many individuals can and do escape from this vicious cycle, its existence seriously threatens the legitimacy of higher education and of health care.

The distribution of employment patterns by gender also exhibits important elements of inequality. In contrast to social origin, there is no stratification of medical schools by gender. Yet disparities are found in the opportunities for postgraduate residency, as shown by our data. Most of the substantial gender differentials in employment patterns can be attributed to the mediating effect of access to residencies. Such differentials acquire additional importance when one considers that the proportion of women in the medical profession is increasing. For example, by 1985 women constituted half the entering class at the most important medical school in the country, up from 38 percent in1979.[24]

Despite their many sobering implications, our findings still leave ample room for policy interventions to correct imbalances. Many of the effects on employment appear to be mediated by the quality of medical schools and the opportunities for postgraduate training. Thus, actions can be implemented to improve inadequate schools and to make admissions dependent on academic potential only and not on the economic status of the student's family. Similarly, residency programs can adopt affirmative action measures that give women equal opportunities based solely on qualifications. In particular, it seems necessary to provide support services that will make the pursuit of a medical career compatible with other social roles.

With respect to those physicians who are already un- or underemployed, it would seem urgent to adopt continuing education programs that may compensate deficiencies in previous training and encourage those physicians to serve in rural areas. Such educational endeavors would have to be complemented by specific incentives, both in monetary terms and in opportunities for future career advancement. The ultimate obligation of protecting the health of the population also makes it necessary to consider mechanisms for the periodic certification of medical competence.

Finally, current effects to restrict the growth of medical schools must continue. Indeed, there can be little do-

ubt that an overabundance of physicians has dysfunctional consequences not only for the medical profession itself, but also for the health system as a whole, including the users of services.

Above all, countries like Mexico must make explicit efforts to redress the inequities that still mar the systems of higher education and health care. The French sociologist Raymond Boudon spoke of "perverse effects" as an analytic category that accounts for the actual functioning of many social institutions.[25] Higher education and health care, two of the fundamental vehicles for promoting equity, are at risk of falling into the perverse effect of reproducing social inequalities. Unless they truly fulfill their role of ameliorating the negative consequences of poverty, they may themselves end up being impoverished institutions. The challenge, in essence, is to harmonize the legitimate aspirations for social advance ment through higher education with the imperative of improving the well-being of the population.

Acknowledgments

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Health care reform and the labor market*

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Reform is probably the most frequently used term in the literature of health care systems. Discussions are broad and general, their topics ranging from the reasons for reform, through the meaning of reform, and prescriptions for carrying out reform in developing countries [1].

In general, interest has centered more on the definition of the content of reform and less on processes of implementation [2]. Implications in terms of changes in the requirements of health facilities and human resources have only been superficially addressed, more in a theoretical manner than in the operation of health care services.

This is not a new problem. It is, in fact, the main problem in implementing international policies such as the Primary Health Care Initiative that dominated the scene for almost 20 years, especially the assessment of the types and qualifications of human resources needed to carry out the changes.

This paper considers the main issues involved between reform of the health care systems and a shift in the needs of human resources, both for the management of health care facilities, as well as for the delivery of services.

Addressed first will be the reasons behind reform in developing countries, using Mexico as an example. This is necessary to understand that even though reform may be seen as a general trend, there are important variations in the forces behind reform in developing countries, as well as in the processes of organizational change needed for reform.

The paper will then analyze changes in health care management that may be necessary for achieving reform in developing countries.

The third section of the paper is devoted to an analysis of changes in the health care labor market, examining the implications for the training of health care managers and personnel. Finally, the main issues involved in the assessment of health care reform are considered, as well as their consequences on human resources training, both for management and for delivery of services.

Reasons behind health care system reform: the case of Mexico

Demographic and epidemiological transitions

The Mexican Health Care System is the sum of preventive and curative services provided by several social security institutions, the Secretary of Health (SOH) and the private sector. Although the SOH is, by law, the coordi-

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nating head of the sector, grossly speaking, each of these institutions act independently in the health care arena, having their own norms, organization and resources as well as different funding mechanisms.

Mexico has a population of approximately 85 million, the second largest in Latin America. While 60% of its inhabitants already live in urban areas, some 12% live in approximately 140,000 scattered small communities. According to the World Bank, Mexico is a "middle-income country", nevertheless, it continues to have great disparities.

As any other developing country, Mexico is currently undergoing a complex transition in all aspects from political to socioeconomic and health conditions. In demographic terms, its population is still growing, but the growth rate is slowing. Life expectancy is increasing, and the elderly population is gaining importance.

In the context of epidemiological transition, Mexico is facing complex challenges that are undesirable consequences of its socioeconomic development and demographic transition. In general, infectious diseases have been brought under control, while chronic diseases and injuries increase in frequency. There are, however, other emergent problems including AIDS and the diverse health effects from environmental pollution, as well as resurgent problems such as cholera--all competing for the scarce resources available. Clearly, it is critically necessary to increase both the efficiency and the effectiveness of the National Health System.

Health policy in Mexico

Efforts are being made to eliminate such serious and vulnerable residual diseases as onchocerciasis and leprosy; also, a universal vaccination program against the six PAI diseases was started in 1990. At the same time, other programs have been developed, including cholera and AIDS control programs.

Matching the health service needs and the geographical distribution of services

A constant issue is how to achieve a match between the health service needs of the population and the geographical distribution of the resources that produce health services (Fig. 1). In Mexico there have been numerous efforts to increase health care coverage. One of the most successful, the implementation of a social service year for medical students, has proved to be limited, especially at a time when there is a reduction in the enrollment of medical students.

In Mexico the medical labor market has developed under the sponsorship of the state. Physicians and other health care providers are usually located close to the public health facilities built by the state. This has generated a particular arrangement where the physicians work for public health care delivery organizations in the morning, attending in the afternoon their private offices nearby.

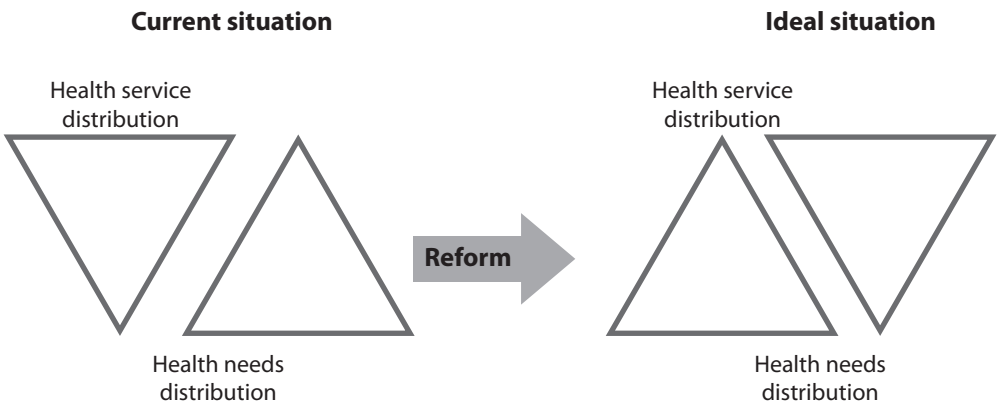


Figure 1. Mismatch between health services needs and the geographical production of health services.

As a result, the market has a peculiar structure. There is an excess of physicians and other health care providers in urban areas, while there is a shortage in rural areas. This imbalance is even more problematic when it is recognized that the training of health care resources often does not match the needs of the health care delivery organizations, creating a need to retrain physicians and others according to organizational need [3]. This is one of the most pressing arguments for initiating reform of the health care system. At the same time, it demands a series of important redefinitions of the profiles, functions and training of health care personnel, both for the direct provision of services and for the management of health care programs necessary to increase coverage.

Because reasons for health care reform are manifold and will vary country by country it is necessary to examine them within a framework of change that will inform policy and technical decisions about the direction of reform, its potential impact and desirable, as well as undesirable, consequences.

Reform and organizational change

Although everyone agrees that the concept of reform implicitly includes the notion of change, until recently there has been no analysis of the framework of organizational change needed to address the reform process. We argue that this is an appropriate theoretical framework for the understanding of the real meaning of reform, as well as being required to assess the intended and unintended consequences of associated necessary organizational change. The objective is to use a conceptual framework that proceeds from a mainly content analysis that has dominated the literature to an analysis of reform processes and the implications of such changes for the management of health services. To understand this better we refer to the work of Kaluzny and Hernfi.ndez on organizational change and innovations [4].

Organizational change models

The first aspect to emphasize is that organizational change has multiple facets. On the one hand, it is necessary to incorporate the different approaches to understand and predict change and its consequences; on the other, it is important to define the level of analysis, given that organizational change can be manifested in different ways according to the level of analysis chosen (e.g. internal change in the operation of a given organization; changes in the organizational structure and its relations with the environment; and social changes that affect populations of organizations).

There are three theoretical models relevant for this type of analysis (Fig. 2).

The *rational model* assumes that organizational performance can be defined without ambiguity. Therefore, it is possible to plan the process of change in organizations and to systematically apply those plans to improve certain aspects of the organization performance.

In contrast, the *resource dependemT model* takes into consideration the possibility that environmental variables can affect internal organizational processes, as well as the way in which the organization responds, adapts or manages the environment, to facilitate organizational change.

The *population ecology model* follows an evolutionary perspective, emphasizing the probabilistic nature of change rather than the deterministic nature emphasized by the rational model. Thus, it assumes that the environment selects these organizational characteristics that are better adjusted to the changes that by various processes occur recurrently in the same environment.

Although these three models are usually considered independently by their respective followers, we consider that each proves useful in understanding process of change, as well as the nature of reform and its determinants.

Based on these models, Kaluzny and Hernfindez proposed three types of change (technical, transitional and transformations) that help toward an understanding of the processes involved in the design and implementation of reform [4], (Fig. 3).

Technical changes

Technical changes are modifications of the means by

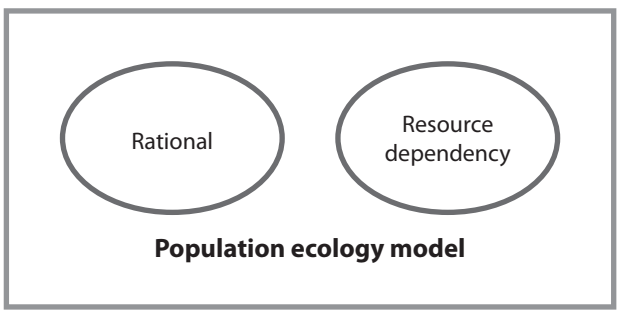
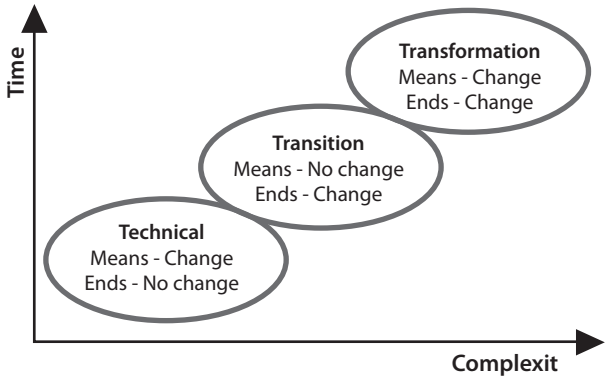


Figure 2. Organizational Models



Source: Modified from Kaluzny and Vency [12]

Figure 3. Types of organizational change.

which the activities of an organization are carried out. Therefore, this type of change follows closely the rational model. Changes can be of two basic forms: technological changes, oriented to the incorporation of new technologies in the organization, a form of change that modifies the way in which processes in the organization are carried out, without changing its ends or goals; and structural and programmatic changes, oriented to the way in which the work in the organization is organized, directed and managed, without changing its ends or goals.

Given that most of the changes proposed in developed countries and proposed by international agencies for middle-income countries fall into this category, the latter form is particularly relevant. Included in these changes are programmatic actions such as the design and implementation of essential health services packages, and structural changes such as the implementation of internal markets. Given their technical nature, these proposals seem the more feasible to implement.

Transitional changes

In contrast to the above type, transitional changes are oriented to changes to ends rather than means. In other words, the rationale of the organization is transformed, but the technology used to attain those ends remains intact. For example, in middle-income countries the sale of public hospitals to private investors does not alter the basic technology of these organizations; it is just that the means are applied to different goals (i.e. profit).

In this category can be included major reform initiatives such as the introduction of market mechanisms in the health sector, and the privatization of public health services.

Transformation

A more complex type of change is transformation, given that it implies a modification to both the means and ends of an organization. Technical and transitional changes may modify completely the nature of an organization. The general model of health reform proposed by international agencies can be categorized in this way, given that it includes the incorporation of structural and programmatic changes, as well as a redefinition of the ends of delivery, financing and regulation.

In general, transformations occur with less frequency than other types of change, but when they do occur the outcome is a major shift in the path that the organization will follow in the future. Therefore, transformations extend beyond the limits of the more technical rational model, demanding the use of more open system models such as resource dependency and population ecology. In other words, analysis of organizational transformations such as health reform proposed by international agencies need a careful consideration of environmental variables, as well as the particular social structure of the country in which the reforms are to be applied.

Limits for reform

How far health reform will be implemented depends on the interaction of multiple forces and the will of particular actors. In general, health reform will tend to be technical, promoting change in the programmatic and internal structural aspects of organizational performance. The extent that health reform moves in the direction of a transition, and thence towards a transformation, means an increasing number of environmental variables and actors participating in its final shape.

Kaluzny provides us with a structure of analysis of organizational change useful in the assessment of the limits of reform. Within this structure, there is a set of contingent relationships between the environment, the different phases of organizational change, the characteristics of the organization, and the attributes of change itself [4].

According to Kaluzny, organizational change involves the following phases: deficient performance assessed according to its mission and goals; recognition of a diagnosis of organizational problems; identification, the definition of alternative courses of action to solve the problems; implementation, a basis for the development of action to facilitate change within the organization; and institutionalization, acceptance of the implemented

change by the relevant actors within and outside the organization.

It is important to note that in many health reforms initiated by international agencies there is an effort to carry out different phases of change, but with a difference: the first three phases are developed externally to both the countries and the health care organizations affected by the changes.J5] Since many of the main actors within and outside the health care organizations will feel threatened by the changes proposed, this creates an obstacle to the implementation and institutionalization of reform.

With regard to the environmental factors, there are at least two factors that should be taken into account: the characteristics of the users of services provided by the organization, both individuals and organizations that receive services; and the network of organizations to which the reforming unit belongs. In health care there are a number of extremely relevant organizations--those concerned with labor, industry, and related organizations that benefit or are affected by changes in the health care system.

A third aspect is the attributes of the organization that may be subjected to change. The type, size and nature of the work are important variables to be taken into account, as well as characteristics of the staff--for example, whether the workers are unionized, the type of union, whether professional, skilled or unskilled.

Finally, attributes of the change in itself must be taken into consideration.

We can now arrive at a number of conclusions.

First, the characteristics of the human resources within the organization are the most important predictors in the initial and final stages of organizational change [4]. Second, the structural attributes of the organization are central during the change implementation stage. This is because at this stage the type of adjustment tends to be of a structural or programmatic nature, or both. Third, the characteristics of the change itself are of importance, particularly cost, uncertainty and communicability of change.

Fourth, organizational change will be facilitated or not depending on the congruence between the change attributes and the organizational characteristics. In other words, the implementation of change will depend upon the extent to which the changes are congruent with the current activities of the organization and the characteristics of its human resources. This occurs independently of organization structure and process. However, if characteristics of the change are far removed from the organization's current activities, change will be affected not only in the implementation phase, but also in its institutionalization.

This analysis is relevant to the analysis of organizational change that can be expected under health care reform. The adoption of the recommended formula for reform, the needs of the new personnel, and the changes in role and functions derived from that formula can be defined following the framework proposed. This is compatible with analysis that criticizes the fact that most discussion around reform has concentrated on content, neglecting processes and difficulties in the implementation of change [2].

This framework will be used to assess health care reform and its consequences for human resources.

The health care labor market

According to organizational theory, one of the main features to consider in the initiation and institutionalization of Organizational change is to define its attributes. We must, therefore, concentrate on the principal characteristics of change proposed for health care reform by international donor agencies (Fig. 4). In general, the changes can be grouped in five categories: the introduction of market mechanisms; a reduction in the size of the public sector; utilization of user charges; the use of costeffective packages of services; and privatization [2].

For example, one of the main causes of disturbance in the health care labor market in Mexico, social inequality in the spatial distribution of human resources, is that all major previous initiatives to increase coverage have failed to take into account the structure of Mexican society, the

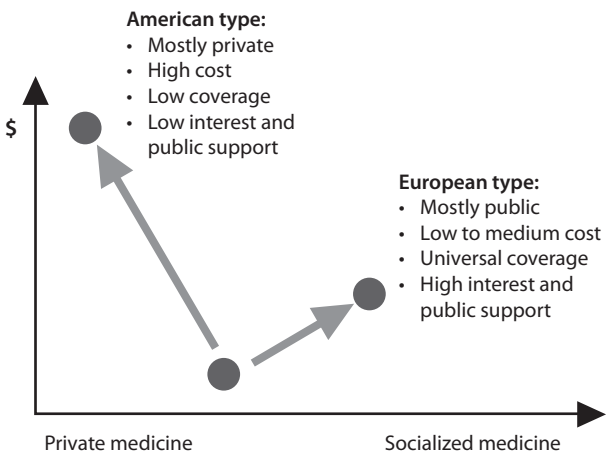


Figure 4. Potential paths for less developed countries.

great social and economic variations across regions, states (provinces) and communities. This can be perpetuated under reform if the market changes proposed are not adjusted to these variations [6, 7].

For example, in 1975 Rushing carried out an analysis of different strategies to improve the distribution of physicians in the U.S. His initiatives were not successful [6] because:

- The enactment of state laws or the implementation of government administrative action was not enough to solve the maldistribution of human resources;
- in most initiatives the social and economic context was neglected; and
- there was a lack of adequate and sufficient training and information received by physicians in particular about the kind of interventions necessary in disadvantaged communities.

In similar fashion, although 20 years later, Hsiao, in a recent analysis of the introduction of market initiatives in developing countries (marketization), reported that this approach had not achieved the expected results [7]. For example, Chile embraced an intense reform centred upon the introduction of HMO-like organizations (ISAPRES) aimed to achieve universal coverage. After more than 10 years the result was a segmented market: one the one hand, a system of limited coverage but good quality (15-20% of the population covered) oriented to take care of the needs of a low health risk population; on the other hand, the remainder, mainly a high health risk population who received health care of reduced quality and a limited number of benefits. Hsiao further argued that a similar pattern has occurred in Singapore, South Korea and the Philippines.

In health care management, when organizational change is underway, Tichy argued that:

> Successful managers of change will at times be political builders of coalitions, power brokers, and influence manipulators coping with the political cycle. At other times they will be solving problems rationally or relying on scientific data and principles to cope with the technical style. Or they may be active as molders of values and ideals [8] (pp. 397-398).

If this is applied to health care reform, it is clear that in developing countries it will be necessary for health care managers, in both the public and private sectors, to change their traditional perspectives towards the organization of health care, as well as effecting a corresponding shift in their professional training and practice. Three themes are particularly important: the development of a sense of social responsibility in the management approach; competition among health care organizations on the basis of not only price but also quality; and management of the relations between the state and health care organizations likely to emerge from reform.

Managing the health services with social responsibility

Physicians work under a different social contract from that which regulates industrial work and commercial transactions [9]. They are responsible for the well-being of their patients, but there is increasing pressure to make them responsible for societal well-being. In other words, in many current health care organizations, physicians face a demand for equity in the distribution of benefits, while at the same time facing the need to reach a balance between cost, quality and access.

This situation can be extended to other health professionals. The challenge is to train both direct providers and health care managers to recognize and accept social responsibility. It is important to keep the fiduciary role of the health provider, but developing countries cannot aspire to a system in which there are no limits to the providers' imagination, with all the technology and resources applied to any individual patient.

Market competition on the basis of price and quality

In any market state regulation is an important factor. There is no doubt that for health care reform the conditions and limitations set by the state will be critical in deciding new forms of organization, financing and delivery. Although there should be incentives to increase productivity, quality and efficiency, it is not clear what mechanisms should apply.

One of the desirable effects of competition among health care organizations could be a modification to the bases of market competition, so that they compete not only on the basis of cost but also of quality. This has to be discussed carefully, especially if the model advanced by international agencies is applied. Planned markets are attractive but difficult, and there are many different ways to implement such a strategy. For example, if a country decides to establish a single financing system, at the same

time that the market is open to the competition of multiple private health care organizations it can be expected that the way to attract more patients (business) will be to offer more and higher quality services. A completely different set of incentives would be in place if the decision is to have a more unregulated market, where quality is sacrificed in the search for economic gains.

Managing relations between the state and health care delivery organizations

The implement of change differs from its institutionalization [4]. Different market strategies can be introduced and implemented, including a set of rules and norms, but never institutionalized. The institutionalization of a market strategy depends on a number of factors. For example, if reform in Mexico were to include the implementation of a system of HMO-like organizations, the institutionalization of this change would depend on the capacity to generate demand for the services offered by the users and the acceptance of such arrangements by the providers. Given that in the experience of the institutionalization of changes and innovations it has been found this depends more on the acceptance of key actors rather than the enactment of laws or other government initiatives, [2]. The role of health care professionals and the existant health care organizations should be assessed [4].

Finally, it is important to assess carefully the tendency to follow fashionable initiatives. In the experience of developing countries that applied market initiatives the results have not been what were expected. Since the early 1980s Ginzberg and others have warned about the perils to follow fads for cost containment initiatives, seen by their proponents as panacea to solve all the problems in the U.S. health care system [10]. In 1994 Marmor discussed this issue and applied the same rationale to support his skepticism about the effectiveness of strategies such as those of the HMOs, PPOs and other organizational forms in which providers share financial risk and incentives to solve the problems in the U.S. [I 1]. In the U.S. such initiatives have resulted in an imbalanced medical market.

This is a clear warning to other countries tempted to initiate this kind of initiatives. If they have been unsuccessful in the U.S. how can it be argued that they would have a positive impact in countries with far fewer resources and technology?

Conclusions

The assessment of the way in which reform affects the medical labor market will be enhanced by the application of a conceptual framework that enables us to focus more on process than on content. As reviewed, both in theory and in practice, human resources are critical.

Looking ahead, we suggest that the role of research as a key contributing factor in decisionmaking must be further strengthened at different levels of the National Health System in the pursuit of health care reform. To become an essential element in its technical and political aspects, health systems research must provide answers to population health needs and population demands. Moreover, the results have to be available at the right time, whatever that means, for each part of the health system.

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Experiencia de las parteras en la identificación de mujeres maltratadas durante el embarazo*

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Hoy en día, en el estado de Morelos, al igual que en otras zonas del país, las parteras juegan un papel importante en la atención de los nacimientos. Algunas de las razones para que esto suceda son: a) históricas: en Mesoamérica las parteras o comadronas jugaban un papel central en la atención y cuidados de las mujeres y los bebés en el momento del embarazo, parto y el puerperio. Este predominio continúa durante la mayor parte de la época colonial. Fue hasta la segunda mitad del siglo XVIII cuando la hegemonía de las parteras comenzó a perder terreno, entre otras razones porque se reglamentó su ejercicio y se subordinó su labor a los médicos titulados;[1-3] b) la existencia de un sistema mixto de atención a la salud, donde interactúan la medicina doméstica, la tradicional, la institucional y la medicina privada;[4] c) la inaccesibilidad a los servicios de salud por parte de un importante sector de la población, por razones estructurales propias al sistema de salud institucional como por cuestiones culturales, tanto de la población que consulta como por la del equipo de salud. Es más, en algunas regiones aisladas y marginadas del país la medicina tradicional y doméstica son la única opción para la atención a la salud para un sector amplio de la población.[5]

Pese a su subordinación y marginación en la atención de los partos, en la actualidad sus servicios son demandados por miles de mujeres, tanto en zonas urbanas como rurales. Diversos estudios[6-8] han documentado la importancia del papel de las parteras como agentes de salud comunitaria, en cuyo campo de acción interviene también la atención a otros aspectos de la salud reproductiva, como la planificación familiar y los cuidados materno- infantiles.

En estudios hechos en Morelos hace más de una década, aproximadamente 50% de las mujeres embarazadas del área rural eran atendidas por parteras.[9] Estos datos son consistentes con un estudio anterior realizado en el ámbito nacional,[10] en el que a partir de datos provenientes de localidades menores de 2 500 habitantes se calculó que las parteras atendían 63% de los nacimientos. En 1987, la Encuesta Nacional Fertilidad y Salud (Enfes) reportó que las parteras tradicionales atienden 44.5% de los nacimientos en comunidades de menos de 2 500 habitantes y 23.7% en comunidades mayores de 20 000 habitantes.[11]

La violencia durante el embarazo y su impacto en la salud de la mujer y del bebé

La exploración del vínculo entre violencia y salud reproductiva ha sido escasa en nuestro medio, a pesar de las diferentes formas en que se expresa: alta prevalencia de

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maltrato durante el embarazo, maternidad forzada ±producto de la violación dentro y fuera del matrimonio, maltrato frecuente a embarazadas adolescentes, contagio de infecciones de transmisión sexual±; todo lo anterior tiene un impacto directo en el aumento de la morbilidad-mortalidad materna.

La violencia doméstica durante el embarazo se comenzó a estudiar a finales de la década de los setenta y principios de la de los ochenta. Los estudios correspondientes se llevaron a cabo principalmente en países desarrollados como Estados Unidos de América y Canadá; algunos informes[12] muestran una variación en la prevalencia que fluctúa entre 9% y 20.1% según el tipo y la edad de la población estudiada. Se ha documentado ampliamente que la violencia en contra de la mujer embarazada tiene efectos adversos en la salud de la madre y del bebé; por ejemplo, una agresión física o sexual que implique traumas abdominales puede provocar abruptio placentae ±el cual, según el tiempo de gestación, podría llevar a la pérdida del embarazo±; la precipitación del parto o el nacimiento de un bebé de bajo peso.[13,14] Otras consecuencias posibles de los traumas abdominales incluyen fracturas fetales, la ruptura del útero, hígado o bazo de la madre, fracturas de la pelvis y hemorragias antes del parto.[15]

Es importante considerar que los efectos del maltrato durante el embarazo no sólo producen lesiones físicas; impactan, además, la salud mental de las mujeres. Esto afecta también a las embarazadas, quienes terminan padeciendo diferentes malestares emocionales como depresión, fatiga, apatía, insomnio y tristeza.[16]

En México, el estudio de la asociación entre violencia y el embarazo ha sido reciente. En el primer estudio se exploraron las características de la violencia y el impacto del maltrato durante el embarazo, y se identificó 33.5% de prevalencia entre las mujeres que acudieron al servicio de ginecobstetricia del Hospital Civil de Cuernavaca; la mayoría fueron maltratadas por sus parejas. Además, se demostró la asociación entre violencia durante el embarazo y efectos adversos en el parto, entre los que destacó el bajo peso al nacer, ya que los bebés de las mujeres maltratadas tuvieron una diferencia de peso de hasta 560 gramos, en comparación con los de las que no sufrieron maltrato.[17]

En otro estudio posterior se identificó una prevalencia de 24.6% de violencia durante el embarazo, y 24.4% en el año previo, entre mujeres que acudieron al control prenatal en los Servicios de Salud de Morelos (SSM) y el Instituto Mexicano del Seguro Social (IMSS), tanto en la ciudad de Cuernavaca como en la de Cuautla. Sin embargo, cuando se observaron los datos de prevalencia de las usuarias de los SSM, éstas tuvieron una prevalencia de violencia de 33% en comparación con 15% de las usuarias del IMSS.*

En México, al igual que en otros países de América Latina, la identificación del maltrato en mujeres embarazadas durante la atención prenatal no es un hecho frecuente.[18-20] Esto se debe, entre otras razones, a que aún no se reconoce a la violencia como un problema de salud pública que afecta también a las mujeres embarazadas y a sus hijos, por lo que no se ha incorporado a la historia clínica perinatal para así facilitar su identificación oportuna. Por otro lado, a pesar de la publicación de la Norma Oficial Mexicana NOM-190-SSA1-1999, "Prestación de Servicios de Salud. Criterios para la atención Médica de la Violencia Familiar",[21] hasta el momento son pocas las entidades que han emprendido actividades dirigidas a su implantación. Esta situación de indefinición administrativa aunada a la falta de recursos económicos para llevar a cabo las actividades mínimas de difusión de la norma, tienen como resultado que el personal de salud desconozca la existencia de este importante instrumento.

Con base en lo anterior, el objetivo del presente estudio fue explorar las experiencias de las parteras en la detección de mujeres maltratadas durante el embarazo, además de conocer los tipos de violencia que identifican con mayor facilidad.

Material y métodos

A través de metodología cualitativa se llevaron a cabo 12 entrevistas semiestructuradas a parteras seleccionadas entre un grupo organizado por el Instituto Nacional de Antropología e Historia (INAH), delegación Morelos, el cual ha auspiciado varias investigaciones sobre las prácticas y recursos de las parteras en este estado.[22,23] La selección se hizo a partir de un directorio que aglutina a 184 parteras de toda la entidad. Este directorio cuenta con la siguiente información: nombre, edad, dirección, teléfono (en algunos casos) y localidad de residencia de cada una de las integrantes.[⊠] Se hizo una selección de aquellas que

* Castro R, Valdez R, Arenas L, Ruiz A. Violencia contra mujeres embarazadas en Morelos (México): un estudio sociológico sobre prevalencia y severidad. 2001. En prensa.

⊠ Las localidades incluidas en el directorio son Xochitepec, Santa María, Coatlán del Río, Temixco, Jiutepec, Cuernavaca, Ahuatepec, Tetela del Volcán, Zapata, Axochiapan, Mazatepec, Amacuzac, Acatlipa, Tlayacapan, Yautepec, Cuautla, Totolapa, Tepalcingo, Anenecuilco, Zacatepec, Tlaltizapán, Tlaquiltenango, Jojutla, Jonacatepec, Puente de Ixtla, Tlalnepantla, Huitzilac, Tepoztlán, Ocotepec y Ocuituco.

se ubicaban en Cuernavaca y sus alrededores. En todos los casos se hizo una visita al domicilio o llamada telefónica a las parteras para explicarles los objetivos del estudio, y si aceptaban participar, se concertaba una cita posterior. Las entrevistas se realizaron en sus casas o en las instalaciones del INAH, según lo dispusiera la informante.

El proceso de recolección de la información se realizó de enero a septiembre de 2001. En las entrevistas se buscó explorar las experiencias de las parteras en la identificación de mujeres maltratadas durante el embarazo. El tiempo promedio de la entrevista fue de 1 h con 15 min. Además de las entrevistas se aplicó una cédula de información sociodemográfica y se incluyó un diario de campo. Se elaboró una guía de entrevista, la cual se fue adaptando durante el proceso de investigación. Se decidió suspender las entrevistas por haber alcanzado el punto de saturación teórica.

La recolección y análisis de la información incorpó las siguientes estrategias:

Todas las entrevistas fueron grabadas e inmediatamente transcritas para ser revisadas.

Se procesó cada entrevista para poder realizar el análisis con el apoyo del programa de cómputo Ethnograph 4.0.

Se realizó una codificación fina de cada una de las entrevistas; para ello se elaboró un listado de categorías analíticas.

Resultados

Se desarrollaron las siguientes categorías analíticas: a) proceso de identificación de las mujeres maltratadas en la atención; b) tipos de violencia que identifican las parteras; c) características de su práctica en la partería; d) respuesta ante la violencia; e) conocimiento acerca de la violencia; f) experiencias personales de violencia. Por razones de espacio, en este trabajo se abordan en profundidad las dos primeras y se retoman la d y la e.

En el cuadro I se presenta la información sociodemográfica de las parteras entrevistadas.

Cuadro I. Datos generales de las parteras entrevistadas. Morelos, México, 2001

	Edad (años)	Estado civil	Número de hijos	Lugar donde trabaja en Morelos	Años de práctica
Partera 1	52	Separada	3	Xochitepec	26
Partera 2	69	Casada	8	Cuernavaca	46
Partera 3	41	Casada	4	Jiutepec	15
Partera 4	54	Viuda	5	Cuernavaca	30
Partera 5	60	Divorciada	10	Temixco	35
Partera 6	52	Casada	4	Cuernavaca	25
Partera 7	57	Viuda	2	Temixco	40
Partera 8	47	Casada	4	Jiutepec	24
Partera 9	58	Casada	4	Cuernavaca,	31
Partera 10	71	Viuda	7	Cuernavaca,	54
Partera 11	54	Casada	3	Atlacomulco	40
Partera 12	76	Viuda	7	Chamilpa	57

La identificación de la violencia que sufren las mujeres durante el embarazo

Se exploraron aspectos relacionados con la identificación de embarazadas maltratadas, tal como la intencionalidad, es decir, si las parteras realizan preguntas dirigidas a la identificación de posibles casos de violencia; si ellas toman la iniciativa o no y las razones para hacerlo.

Un aspecto recurrente en las respuestas fue que la mayoría de las entrevistadas se ha enfrentado en su práctica a varios casos de mujeres maltratadas; la mayoría tuvo abundantes testimonios sobre mujeres maltratadas durante el embarazo. Ante la pregunta ¿sus pacientes le reportan ser maltratadas por sus parejas?, estas fueron algunas de las respuestas:

> - Sí, sí me han tocado muchas mujeres cuando están embarazadas van conmigo y me platican sus problemas (Partera 3 Ln. 582-585).
> -Sí, me vienen maltratadas ya embarazadas (Partera 4 Ln. 568-569).
> -Sí, hay varias experiencias muy tristes (Partera 2 Ln. 392-393).

En general, en la atención se observaron dos tendencias respecto al proceso de identificación de mujeres maltratadas. En primer lugar, aquella en donde la partera no pregunta de manera directa sobre la violencia, por una incomodidad manifiesta, y la otra se refiere a la voluntad de las mujeres para hablar, es decir, tomar la iniciativa en la narración de sus experiencias de violencia; cabe señalar que esto fue lo más común entre las parteras entrevistadas.

La incomodidad para iniciar la indagación sobre la violencia

Las parteras mostraron una abierta incomodidad para tomar la iniciativa en la indagación sobre las experiencias de violencia entre sus pacientes. Este temor de verificar algo que se sospecha, como el maltrato a una mujer embarazada, produce un sinnúmero de reacciones emociona-

les difíciles de manejar. El siguiente testimonio ilustra lo anterior:

> - ¿Usted acostumbra preguntar sobre experiencias de violencia o maltrato en sus pacientes?
> A mí no me gusta, porque bueno yo en primer lugar como que soy muy sensible, como que no acepto esa clase de maltratos, no quiero darme cuenta de eso, sé que existe pero no quiero, no lo acepto yo en mi persona, entonces yo no les pregunto. Si ellas inician la plática y quieren desahogarse tampoco yo las puedo callar y dejo que hable, que hablen todo lo que quieran, porque esa es una forma de desahogarse y pues ya si encuentro palabras como orientarlas o darles ánimo pues lo hago pero en una forma de no mezclarme en este tipo de problemas sino de buscar la forma en que ella reaccione, que recapacite y pues la ayudo. (Partera 2 Ln. 593-610).

En el testimonio anterior se expresa la intención de "ocultar" algo que se sabe que existe, que es común y afecta a un gran número de mujeres. Así, la partera reproduce una de las respuestas sociales más frecuentes ante la violencia doméstica, es decir, la negación, la cual se expresa a través del silencio alrededor de la violencia que viven las mujeres.

Además, la partera toma distancia entre ella y la mujer maltratada como una estrategia para no involucrarse, como si con ello se pudiera evitar su existencia. La reacción de la partera entrevistada se explica por la dificultad para manejar emocionalmente su reacción. Este aspecto del testimonio ilustra la necesidad de proporcionar al personal de salud las herramientas que les permitan contener sus propias emociones ante las narraciones o evidencias del maltrato en sus pacientes.

La voluntad de las mujeres de hablar de la violencia

A través de las narrativas de las parteras, se pudo apreciar las pocas limitaciones que tienen algunas mujeres para hablar de la violencia que viven, lo cual evidencia, en primer lugar, el nivel de confianza que tienen con la partera que las atiende. En segundo, la necesidad de las propias mujeres de ser escuchadas. Una partera señaló: "Ellas vienen y nos lo dicen". Los siguientes testimonios profundizan en lo anterior:

> Sin preguntarles a veces empiezan a decir y a veces con eso, mire, se componen (Partera 9 Ln. 339-340).
> - ¿Cómo ha identificado mujeres maltratadas en su consulta?
> - Vienen golpeadas, llorosas, llegan desveladas, muy deprimidas y pues empiezan a platicar... En otras ocasiones pues se da una cuenta porque llegan golpeadas, llorosas quejándose con uno... (Partera 12 300-308).

En otros casos, las parteras informaron llevar a cabo preguntas explícitas para identificar posibles situaciones de violencia en sus pacientes, sobre todo cuando tienen sospechas; éstas pueden ser la presencia de viejas lesiones físicas como moretones, nariz chueca, ojos morados, o por la actitud de la mujer de timidez y miedo.

Varias parteras señalaron algunas de las características que delatan a las mujeres maltratadas: la timidez, ser miedosas, incapaces de tomar decisiones sobre el cuidado a su salud y un descuido visible en su apariencia. Estas señales permiten preguntar de manera directa. El siguiente testimonio ilustra este aspecto:

> -¿Cómo ha identificado mujeres maltratadas en su consulta?
> -Pues a veces porque son cohibidas, como que tienen miedo de verla a una de frente, como que esconden ese miedo, sienten que la va a ver uno así diferente, entonces les digo ¿te maltrata tu esposo? ¿Te golpea? ¿Pasa algo con él?
> -Dime, yo te voy a ayudar, si está en mis manos yo te ayudo. Primero la confianza para que ellas puedan sacar todo lo que traigan; encima, yo también fui maltratada y no quiero que haya más mujeres así. Entonces cuando yo les empiezo a platicar algo de lo mío, así ya se sueltan (Partera 12 Ln.618-638).

Es importante observar la estrategia de la partera para identificar señales que, sabe, están relacionadas con el maltrato a la mujer; además, se pone de manifiesto su sensibilidad para dar confianza, brindar apoyo y hablar de su propia experiencia, lo cual le abre las puertas para enfrentar de manera directa la violencia que sufren las mujeres. La partera, a partir de su conocimiento empírico, pone en juego todo lo que el personal especializado ha señalado como los pasos a seguir para realizar un adecuado proceso de identificación, el cual incluye observar señales de alarma, preguntar de manera directa sobre la violencia, brindar apoyo y hacerle ver a la mujer que la violencia es algo común para muchas mujeres.

Otra partera señaló la observación de ciertos síntomas que le permiten suponer que la mujer está siendo maltratada, y entonces pregunta directamente. Este es su testimonio:

> ¿Cómo identifica usted a mujeres maltratadas en su consulta?

> Pues a veces que le sube la presión, que hacen coraje, que traen un dolor y luego ahí les empiezo a preguntar, y me dicen: hice coraje, me peleé con mi marido, y ya de por ahí sale. Por eso se da uno cuenta, porque en el momento les sube la presión, están llorando, se sienten mal (Partera 9, Ln. 324-334).

El testimonio anterior revela cómo la experiencia de la partera le permite asociar ciertos síntomas con la violencia que sufren las mujeres, manifestando un manejo de las repercusiones de la misma en el bienestar de la embarazada. Esto se expresa mediante la presencia de un malestar generalizado que se expresa en la elevación de la presión arterial y un dolor difuso que la partera identifica claramente como consecuencia del enojo ocasionado en la mujer por su marido.

Tipos de violencia que identifican las parteras

En todos los casos, la violencia más evidente fue la de tipo físico. En varias ocasiones las parteras señalaron haber visto a sus pacientes con lesiones visibles en diferentes grados de intensidad, las cuales incluyen equimosis en cara y cuerpo, equimosis en el vientre ya avanzado el embarazo, cortaduras de machetazos en brazos y manos, labios reventados, párpados edematizados y con equimosis y costillas fracturadas.

Conviene mencionar que la violencia física identificada por las parteras varió en términos de severidad, es decir, identifican, tanto casos de violencia "leve", cuyas lesiones más frecuentes son las equimosis y contusiones en diferentes partes del cuerpo, como casos de violencia "severa", considerada así por el grado de peligrosidad de las lesiones infligidas en contra de la mujer. Los testimonios en los que se involucró formas de violencia severa fueron frecuentes en la narrativa de varias de las parteras entrevistadas.

Una de ellas narró el caso que más le ha impactado en su experiencia, y es el siguiente testimonio que se refiere a una mujer que tuvo un trabajo de parto prematuro como consecuencia de la golpiza que su marido le propinó en el tercer trimestre del embarazo:

> -Me llamó una vecina que fuera a ver a la señora que se quejaba de muchos dolores, pero que ella no tenía todavía el tiempo para el parto normal. - Yo le dije- dígale que venga, aquí la voy a checar. - No- doña es que no puede caminar, la golpeó su esposo. - Estaba la pobre con el ojo cerrado, la boca bien inflamada, bien moreteada. Le dije a la señora- ¿qué le pasó?, - Es que llegó (el marido) y me pegó. Me dijo que no le servía ya como mujer, que yo nada más servía cuando no estaba embarazada.- La chequé, le dije que el bebé ya iba a nacer, pero yo no quería atenderla porque tenía hemorragia. Me dijo- atiéndame usted. ± No- le dije -. Este parto viene mal.
>
> La chequé y el niño no se le movía muy bien. Tenía la presión (arterial) muy alta. Yo le expliqué- usted puede tener una convulsión y que hacemos aquí. Mejor vamos, mejor yo la llevo al hospital.
>
> -Tengo miedo- me dijo.
>
> -No, yo la voy a acompañar.
>
> La llevé al hospital, le expliqué al doctor: "mire a la señora la golpearon, está embarazada pero no está a término y ya tiene contracciones".
>
> -¡Qué barbaridad! Esta señora está muy golpeada- me dijo el doctor. Le tomaron una radiografía, tenía fracturada una costilla, tenía una pierna luxada. Estaba muy mal.
>
> La señora dijo que el marido le había dado de patadas en el vientre. Tenía el vientre todo morado.
>
> En el hospital el bebé nació con fractura de su hombrito, le pusieron una férula y se compuso el bebé. Nació de muy bajo peso, sobre todo el bebé lloraba mucho, a pesar de comer, lloraba mucho (Partera 9 Ln. 1137-1269).

Este testimonio pone en evidencia la severidad de la violencia que algunas mujeres experimentan durante el embarazo, la cual se caracteriza por golpes y patadas dirigidas al abdomen. Otro aspecto a considerar es el nivel de control que el hombre ejerce sobre el cuerpo de la mujer, dicho deseo se ve limitado ante la presencia del otro ocupando el espacio y el cuerpo de la mujer "que le pertenece". Esta imposibilidad de uso sexual de su mujer es lo que le produce una profunda rabia y acomete directamente en contra del vientre visiblemente preñado.

El tipo de violencia como la anterior pone en evidencia el nivel de vulnerabilidad de una mujer embarazada ante un ataque de esta magnitud, tal como lo ilustran las lesiones infligidas en su contra: la fractura y la luxación. Sobre todo, la precipitación prematura del parto, la hemorragia y la pre-eclampsia, que ponen en riesgo su vida y la del bebé. El testimonio también ilustra el impacto de la violencia en el bebé en gestación como el bajo peso al nacer y las fracturas fetales.

Respecto al reconocimiento de otros tipos de violencia en la práctica de las parteras, la violencia verbal es una experiencia común entre las mujeres embarazadas. Las riñas y peleas con el marido son reportadas a las parteras por las mujeres con regularidad. En el caso de la violencia sexual, la mayoría de las parteras dejan que sean las propias

mujeres quienes hablen de este tipo de experiencias pues lo consideran muy delicado para abordarlo de manera directa. Algunas de ellas comentaron que sus pacientes les informan que los maridos las acosan sexualmente durante el embarazo o en el puerperio.

Otra experiencia común en las parteras fue la identificación de casos de mujeres violadas, tanto las que son abusadas por sus parejas como aquellas que son violadas por desconocidos y, como consecuencia, la mujer queda embarazada.

Discusión

Es importante resaltar algunos de los hallazgos más sobresalientes del estudio. En primer lugar, la familiaridad de las parteras con la violencia que viven de manera cotidiana las mujeres embarazadas, lo cual arroja luz sobre las circunstancias y condiciones en las que se presenta la violencia hacia las mujeres embarazadas, y cuyos primeros datos generales habían sido reportados por los estudios de prevalencia.[17,*]

Además, es importante hacer una comparación entre la experiencia de las parteras y lo comunicado por los médicos del primer nivel de atención del municipio de Cuernavaca en un estudio anterior;[19] en dicho estudio los médicos señalaron que en su opinión la violencia durante el embarazo era una situación poco frecuente en la población que atienden, pues sus experiencias en la identificación de mujeres embarazadas maltratadas eran escasas. Esta discrepancia entre ambos pone de manifiesto diferencias sustanciales entre ambas prácticas; por ejemplo, los distintos conceptos de atención a la salud, el tipo de interacción entre quién atiende y quién consulta, la definición de su campo de intervención, por mencionar las más importantes. En el caso de las parteras ellas están insertas en el mismo contexto cultural y geográfico de las mujeres que atienden, su relación está definida más horizontalmente y, por lo tanto, existe menos distancia entre una y otra. Esta es una diferencia sustancial en comparación con la relación médico-paciente en el escenario institucional.[⊠]

Las parteras, si bien no preguntan rutinariamente de manera directa, sí responden ante la confesión de las mujeres que sufren violencia, ya sea: a) a través de una escucha atenta que les permite a las mujeres hablar hasta que quieran de su problema, proporcionando algún consejo de qué hacer; b) atendiendo su malestar físico o emocional a través de diferentes intervenciones como masajes o sobadas, infusiones para los nervios, y c) como acompañantes a diferentes instancias para que reciban atención donde pueden pedir apoyo para resolver su problema de violencia.* Esta respuesta de las parteras es consistente con lo reportado por González (1998) en una comunidad indígena del estado de Puebla.[18]

Otro aspecto a resaltar desde la experiencia de las parteras se refiere a las señales no físicas de la violencia que algunas identificaron en las mujeres maltratadas, como la timidez, ser miedosas, incapaces de tomar decisiones sobre el cuidado a su salud y un descuido visible en su apariencia. Estas características también fueron reportadas por algunos médicos del primer nivel de atención; sin embargo, es importante profundizar en la asociación de la violencia doméstica con el descuido de la salud de las mujeres. Si bien en la mayoría de los estudios sobre violencia y salud se resalta el impacto de la violencia en términos de lesiones físicas, una forma de impacto poco reconocida, pero con serias consecuencias, se refiere a la imposibilidad de las mujeres maltratadas de tomar decisiones sobre el cuidado para su salud. Este dato es de suma importancia para el personal de salud, tanto médicos como parteras, que atienden a mujeres maltratadas embarazadas, ya que debe ser tomado en cuenta para la identificación de la violencia y no ser malinterpretado como un simple descuido. Por otro lado, esta reacción de la mujer maltratada refleja el impacto de la violencia en su psique y su cuerpo, hecho que ha sido documentado en la literatura especializada, la cual señala las alteraciones cognitivas como consecuencia de la violencia, entre las que resalta la pérdida de noción del peligro en la cual se encuentran.[24]

Para finalizar, llama la atención la abundancia de testimonios de mujeres que fueron golpeadas en el abdomen en un estado avanzado del embarazo. Este aspecto ha sido reportado, tanto en el ámbito nacional como internacional. En México, en 1990, en un estudio a población abierta, se reportó que 20% de las mujeres maltratadas había experimentado golpes en el vientre estando embarazadas.[25] En

* Castro R, Valdez R, Arenas L, Ruiz A. Violencia contra mujeres embarazadas en Morelos (México): un estudio sociológico sobre prevalencia y severidad. 2001. En prensa.

⊠ Para profundizar en este aspecto se puede consultar Cao Laura. Entre parteras y médicos. Diálogos sobre atención a la salud. Asociación Mexicana de Población. México, en *Los silencios de la salud reproductiva: violencia, sexualidad y derechos reproductivos*. Fundación MacArthur/ Asociación Mexicana de Población, México, 1998: 193-222.

* Este aspecto se aborda en otro documento derivado de la misma investigación.

el ámbito internacional Bohn, en 1990, ha señalado que la violencia es más frecuente y severa durante el embarazo, y con mayor frecuencia dirigida al abdomen.[26]

Con base en lo anterior proponemos las siguientes recomendaciones a partir de los resultados del estudio. En primer lugar, es urgente incluir a las parteras dentro de los planes y programas para atender a la violencia familiar desde el sector salud, debido a que la práctica de las parteras va más allá de atender a las embarazadas.

Por otro lado, la mayoría de las parteras entrevistadas expresó interés en conocer más sobre violencia, sus repercusiones en la salud y, sobre todo, cómo poder ayudar a las mujeres que demandan su apoyo y solicitan sus consejos. En este sentido, se propone diseñar un manual y un programa de capacitación sobre la materia, especialmente diseñado para las parteras, tal como se hizo en el caso del personal de salud oficial.[27]

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Enfermeras con licenciatura en México: estimación de los niveles de deserción escolar y desperdicio laboral*

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En la actualidad existe una preocupación creciente en los sistemas de salud del mundo sobre la situación educativa y laboral de las enfermeras, ya que son identificadas como un grupo que tendrá cada vez mayor importancia en la respuesta de los sistemas de salud a las condiciones epidemiológicas futuras de las poblaciones.[1] En México existe cada vez mayor interés por entender las distintas formas de desperdicio de los recursos humanos, incluidas las enfermeras, ya que la reducción de este fenómeno permitirá cumplir con objetivos relacionados con la capacidad de respuesta del sistema, particularmente con su eficacia y su calidad.

De acuerdo con datos publicados por la Secretaría de Salud, en 2001 el personal de todos los niveles de enfermería que se encontraba laborando en instituciones en México, tanto públicas como privadas, ascendió a 222 389. De este total, 13.6% estaba ocupado en el sector privado. Por otra parte, para 2002, las instituciones públicas no lograron incorporar un mayor número de trabajadores, ya que el personal creció únicamente 0.4% en relación con el año inmediato anterior.[2]

Tanto en países industrializados como en países en vías de desarrollo, se considera que el número de enfermeras graduadas en la universidad no cubre las necesidades de atención de la población. Esta percepción de escasez es generalmente compartida por todos los actores, tanto institucionales como profesionales. Sin embargo, esta percepción raramente está basada en evidencia científica, ya que son pocos los estudios realizados en este campo. La gran mayoría de los estudios sobre enfermería se centran en las reflexiones alrededor de su formación, de su condición profesional y de su participación en las instituciones de salud.[3] La información que brindan los estudios sobre el mercado de trabajo de las enfermeras es importante para poder estimar la relación existente entre la oferta y la demanda de enfermeras. Por ejemplo, para 2002, en Canadá se consideraba que existía una escasez de enfermeras graduadas de las universidades. Sin embargo, al mismo tiempo, del total de enfermeras disponibles se registraba la existencia de un porcentaje (9.3%) que no ponía en práctica sus conocimientos.[4] En otros países con diferentes grados de desarrollo se ha identificado el mismo patrón: una percepción de escasez combinada con la existencia de enfermeras sin oportunidad para aplicar laboralmente los conocimientos obtenidos en la formación.[5-7]

En este artículo se pretende realizar un acercamiento al problema del desperdicio de la capacidad del personal de enfermería en México, tanto en el proceso de forma-

* Este artículo se reproduce con la autorización de la revista Salud Pública de México.

ción académica a nivel licenciatura como en el ámbito del mercado de trabajo. En este último se busca identificar si las personas que estudiaron enfermería tienen un empleo y si las actividades remuneradas que realizan están o no vinculadas con su capacitación académica. El objetivo es cuantificar, en el ámbito educativo, el número de personas que inician un proceso de formación profesional pero no lo terminan; y en el ámbito laboral, el número de personas que al terminar su formación no ponen en práctica los conocimientos aprendidos en la escuela. Ambos fenómenos implican un desperdicio de recursos sociales cuya reducción debe ser considerada como prioritaria tanto en el sector salud como en el educativo.

En México, el personal de enfermería es formado en distintos niveles educativos que van desde el básico, el técnico, el medio superior, el superior y el posgrado. En cada uno de ellos existe una cantidad enorme y heterogénea de instituciones educativas. Su número exacto es difícil de precisar, en gran medida por la falta de regulación y control en cada nivel. Debido a la carencia de información confiable y actualizada sobre la matrícula, los egresos, la eficiencia terminal y el abandono, se determinó que el presente trabajo se limitará a la formación de enfermeras en el nivel de licenciatura: su matrícula, su distribución por sexo, así como la tasa de abandono de las personas que se han matriculado en ese nivel de estudios.

La participación laboral de las enfermeras entrenadas en el nivel de licenciatura ha sido escasamente estudiada. En otros grupos ocupacionales, como el de los médicos, este desperdicio ha sido documentado; sin embargo, no existen datos para comparar el volumen de desperdicio entre grupos ocupacionales con formación de nivel licenciatura, en los que la inversión social per cápita es más alta.[8]

Por otra parte, en México este fenómeno es parte de la paradoja de los recursos humanos para la salud, la cual se expresa a partir de la inversión de enormes cantidades de recursos financieros para la formación de individuos de alto nivel de especialización en el campo de la salud (todavía un gran porcentaje de esos recursos son públicos) mientras, al mismo tiempo, existen aún grandes grupos de población en el país que tienen un limitado acceso a los servicios de salud.[9]

Cabe agregar que el problema del desperdicio no es propio de las enfermeras ni de los recursos humanos formados para el sector salud. Se trata de un fenómeno que comprende al conjunto de egresados de las instituciones de educación superior y que requiere de respuestas inmediatas y efectivas por parte de las autoridades involucradas. En un estudio reciente de la Asociación Nacional de Universidades e Instituciones de Educación Superior (ANUIES), se muestra cómo alrededor de 50% de los egresados de dichas instituciones no trabajan en las especialidades para las que fueron formados.[10]

El presente estudio muestra y analiza información sobre el desperdicio del personal de licenciatura en enfermería, tanto en el proceso de formación como en su participación en el mercado laboral.

Material y métodos

Respecto al desperdicio durante la formación, se utilizaron datos publicados por la ANUIES, la cual es una institución no gubernamental que durante los últimos 35 años ha asumido la tarea de compilar y sistematizar la información proveniente de las 138 instituciones públicas y privadas afiliadas a ella.

Fue necesario realizar cálculos propios a partir de datos correspondientes a estudiantes de primer ingreso y graduados publicados por esta Asociación[11] para definir el grado de abandono por generación, con cohortes de cuatro años cada una. Se comprendió el periodo de 1978-2002, y se incluyó a 21 generaciones escolares.

Como parte de la estrategia metodológica del estudio se considera necesario exponer los siguientes conceptos.

Abandono

Es la ausencia definitiva de los estudios sin haber concluido en su totalidad el plan de estudios de la carrera respectiva,[12] esto por razones de carácter personal, institucional o social.* Algunos de los motivos del abandono son: problemas familiares, hábitos de estudio, condiciones económicas, inadecuada orientación vocacional, baja motivación, edad avanzada, estado civil, o bien debido a la falta de dedicación a la escuela por motivos laborales.

Tasa de desperdicio escolar (TDE)

Es el número de personas que abandonó sus estudios de licenciatura en un periodo determinado, dividido entre el número de personas que ingresaron cuatro o cinco años antes, dependiendo de la carrera en cuestión. Esta tasa puede calcularse por año escolar y/o por generación.[12]

* Universidad Autónoma Metropolitana. Análisis de la deserción estudiantil en la UAM, 1990. Documento no publicado.

Para el cálculo del desperdicio en la formación de los estudiantes de la licenciatura en enfermería, se trabajó con la siguiente fórmula:*

$$\frac{\text{Total de abandonos de una generación}}{\text{Total de estudiantes de primer ingreso de la misma generación}} = \text{Tasa de desperdicio escolar x 1 000}$$

En relación con el mercado de trabajo, uno de los propósitos del artículo fue probar una metodología para calcular una tasa global de desperdicio laboral que pueda ser utilizada en estudios similares en diferentes naciones. Debido a que muchos países no cuentan con encuestas nacionales de empleo, se decidió usar para este propósito el Censo de Población. Para el presente artículo se trabajó la base de datos del XII Censo General de Población y Vivienda 2000 (publicado por el INEGI) y no la Encuesta Nacional de Empleo Urbano, que ha sido una fuente utilizada en otros estudios realizados en México. Se exploró la información a partir de cuatro tópicos que explícitamente aparecen en el cuestionario ampliado de la muestra censal: el nivel académico, la carrera cursada, la condición de actividad y la actividad económica. Los datos se ordenaron a partir de las variables sexo, edad e ingresos.

Además, recientemente el uso del Censo como fuente de información para realizar estimaciones sobre la participación laboral de las ocupaciones de la salud ha sido recomendado por la Organización Mundial de la Salud (OMS) como una opción con limitaciones, pero que permite la estimación de indicadores básicos y comparables en el ámbito internacional.[13]

Una definición metodológica del presente trabajo, está relacionada con la estimación de la tasa global de desperdicio laboral entre las personas que estudiaron la licenciatura en enfermería. Como parte de este desperdicio se incluyen personas que por diferentes razones no ponen en práctica en el mercado de trabajo los conocimientos adquiridos en su formación, estando en capacidad física de hacerlo. Se consideraron tres grupos: aquellos que trabajan en actividades ajenas al área que estudiaron, los desempleados y los que se dedican a quehaceres en el hogar.

La estimación de las tasas se realiza a partir de las siguientes definiciones:[14]

Empleados. Son los egresados de la licenciatura en enfermería que están dedicados a actividades relacionadas con esa disciplina. También se incluye a las enfermeras que se dedican a la investigación y/o a la docencia y a las ocupadas en cargos directivos dentro del sector salud o educativo en el área de la salud.

Subempleados cualitativos. Comprende a las personas que concluyeron sus estudios pero que realizan actividades totalmente ajenas a su formación.

Desempleados. Incluye a aquellas personas que están en espera de que se resuelva una solicitud de trabajo (y no están buscando más), a los desalentados que ya no buscan empleo y a los que se encuentran buscándolo activamente.

Dedicados al hogar. Son las personas que concluyeron sus estudios de licenciatura en enfermería y que se ocupan exclusivamente en quehaceres del hogar.

Los siguientes grupos no se incluyen en el cálculo de la tasa de desperdicio, sin embargo, es importante definirlos:

Inactivos no disponibles. Dentro de este grupo se encuentran los jubilados, los pensionados y los incapacitados permanentes.

Estudiantes. Se considera a las personas que se encuentran en un periodo de entrenamiento posterior a la finalización de la licenciatura.

En resumen, dentro del desperdicio laboral se considera a todas aquellas personas entrenadas que no aplican sus conocimientos en actividades relacionadas con su formación, aun cuando están en capacidad física de hacerlo, entre las que se encuentran las subempleadas, las desempleadas y las dedicadas al hogar.

A fin de dimensionar la tasa de desperdicio laboral, el presente trabajo también estima la tasa de desempleo utilizando la siguiente fórmula:

$$\frac{\text{Desempleados}}{\text{Empleados + subempleados cualitativos + desempleados}} = \text{Tasa de desempleo x 1 000}$$

La fórmula para calcular la tasa de desperdicio laboral es la siguiente:

$$\frac{\text{Desempleados + dedicados al hogar + subempleados cualitativos}}{\text{Total de egresados - estudian - inactivos no disponibles}} = \text{Tasa de desperdicio x 1 000}$$

* La tasa de desperdicio escolar fue generada a partir de los índices de deserción, es decir, en sentido opuesto a la fórmula convencional para calcular el índice de eficiencia terminal en instituciones educativas (Martínez, 2001).

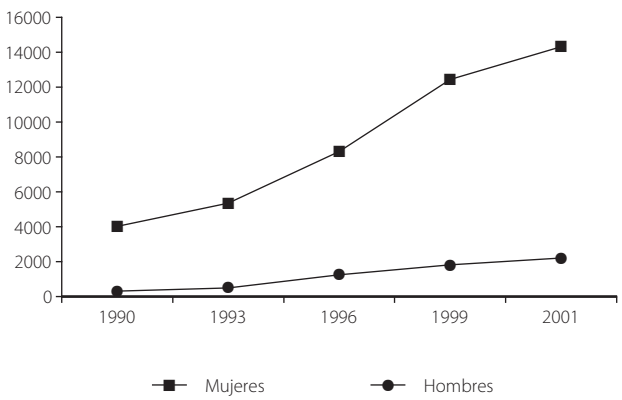
Resultados

Matrícula de licenciatura y desperdicio escolar

Durante el periodo 1990-2001, la matrícula de la licenciatura en enfermería mantuvo un constante incremento, de tal manera que casi se cuadruplicó al pasar de 4 356 estudiantes a 16 515.

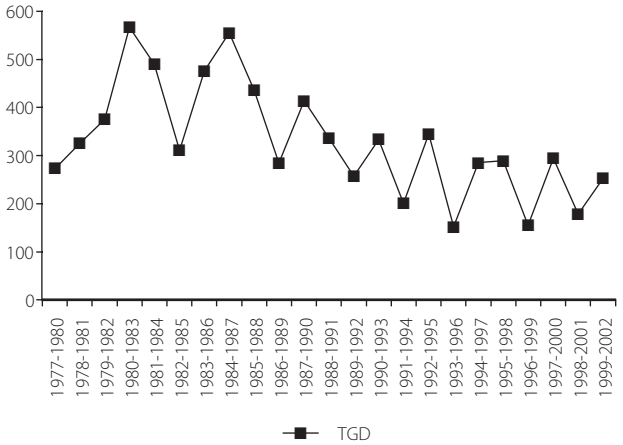
Al dividir la matrícula por sexo se puede apreciar el predominio de las mujeres, quienes en 1990 representaron 92.4%, pero cuya presencia disminuyó a 86.6% 11 años después. La licenciatura en enfermería continúa siendo una ocupación altamente feminizada a pesar del incremento de la presencia de hombres (figura 1). Si bien se puede apreciar un aumento en la proporción de hombres egresados, que pasa de 10.8% en 1996 a 14.5% en 2001, llama la atención que entre la población que se tituló, la participación de los hombres no aumentó de la misma manera; de hecho, disminuyó un punto porcentual al pasar de 9.8% a 8.8%, en 1996 y 2001, respectivamente.

Asimismo, es interesante observar por bloques generacionales el comportamiento del desperdicio en el estudiantado. En este sentido, la TDE, durante el periodo 1977-2002, muestra un comportamiento no lineal pero con una tendencia clara a la disminución a partir de 1983. Así, la TDE para el grupo que terminó en 1983 llegó a un máximo de 567 por cada 1 000. (figura 2). En la cohorte correspondiente a los años 1993-1996 la tasa se redujo a 152 por cada 1 000. Las variaciones interanuales se pueden atribuir, en parte, a la baja calidad e imprecisión de los registros, o probablemente a la difícil situación económica imperante durante el periodo, lo cual obligó a muchos estudiantes a dejar sus estudios universitarios.[15]



Fuente: ANUIES, Anuarios Estadísticos, 1990-2001, México

Figura 1. Matrícula total de la licenciatura en enfermería por sexo, 1990-2001



Fuente: ANUIES, Anuario Estadístico, 1977-2002, México

Figura 2. Tasa de Desperdicio Escolar (TDE) en la licenciatura en enfermería por cada mil estudiantes, por generación, 1977-2002

Mercado de trabajo

Del total de personas que estudiaron licenciatura en enfermería* (104 825) registradas en el Censo de 2000, 55.2% realizaban actividades remuneradas en el área que estudiaron. Por su parte, 15.4% de los egresados trabajaban en actividades ajenas a su formación académica, mientras que 16.2% del mismo total se dedicaban al hogar. La suma de estas dos últimas actividades representa 31.6% del total de egresados. Es decir, 33 099 personas realizan tareas que no requieren para su desempeño de la calificación académica adquirida.

La situación ocupacional de este personal de enfermería presenta algunas diferencias entre sexos en cuanto a su empleo en el área que estudiaron: del total de hombres con nivel licenciatura y con posgrado, 60.9% se encuentra empleado, mientras que el porcentaje del total de mujeres en la misma condición fue de 54.9%. Donde también existe un margen de diferencia es entre las personas que se encuentran estudiando: 5.9% del total son hombres, en tanto que las mujeres representan únicamente 2.0%. Respecto

* Debido a que en la base de datos no fue posible separar la licenciatura del posgrado, ambos niveles se incluyen en la misma cifra. Es sabido que las enfermeras con posgrado representan un bajo porcentaje del total.

a las personas que se ocupan en el hogar, la disparidad es aún más marcada: 1% del total de hombres frente al 16.9 de las mujeres (cuadro I).

A partir de las definiciones expuestas y de las fórmulas planteadas en la metodología respecto a las tasas de desempleo y de desperdicio se obtuvieron los siguientes resultados:

El desempleo afecta a 88 de cada 1 000 personas que estudiaron licenciatura en enfermería; se han encontrado importantes diferencias entre mujeres (89 por cada 1 000) y hombres (56 porcada 1 000).

En cuanto al desperdicio laboral, la tasa estimada fue de 410 por cada 1 000 y al diferenciarla por sexo, de nuevo la más alta resultó para las mujeres con 413 por cada 1 000, frente a la registrada para los hombres, que fue de 336 por cada 1 000 (cuadro II).

Discusión

A pesar de la escasez de evidencias para diagnosticar con exactitud el fenómeno, se puede asegurar que en México el desperdicio de la capacidad de trabajo de los recursos humanos en el sector salud es un hecho, que además genera distintas implicaciones sociales y económicas. Lo anterior confirma que el desperdicio entre las enfermeras es un claro indicador de una inadecuada distribución del personal, tal como sucede con los médicos.[16] Como se señaló anteriormente, la consecuencia no aceptable de este fenómeno es que al mismo tiempo existan en el país poblaciones que no tienen acceso a los servicios de salud de manera permanente por falta de recursos.[9]

Cuadro I. Situación ocupacional del personal de enfermería con licenciatura y posgrado por sexo, 2000

Situación ocupacional	Total	%	Hombres	%	Mujeres	%
Total nacional (T)	104 825	100	4 868	100	99 957	100
Empleados (E)	57 834	55.2	2 964	60.9	54 870	54.9
Subempleados cualitativos (S)	16 128	15.4	1 206	24.8	14 922	14.9
Desempleados (D)	7 143	6.8	249	5.1	6 894	6.9
Estudian (Es)	2 286	2.2	289	5.9	1 997	2.0
Se dedican a quehaceres del hogar (H)	16 971	16.2	49	1.0	16 922	16.9
Inactivos no disponibles (I)	4 463	4.2	111	2.3	4 352	4.4

Fuente: Datos generados por FUNSALUD a partir del XII Censo General de Población y Vivienda, 2000, México

Cuadro II. Cálculo de tasas de desempleo y desperdicio, 2000

Donde: E= Empleados, Es= Estudian, D= Desempleado, H= Se dedican al hogar, S= Subempleados cualitativos, I= Inactivos no disponibles, T= Total nacional.

Tasa de desempleo= D / (E+S+D)

$$\frac{7\,143}{57\,834 + 16\,128 + 7\,143} = 88 \text{ x mil}$$

Tasa de desperdicio= (D+H+S) / (T- Es - I)

$$\frac{7\,143 + 16\,971 + 16\,128}{104\,825 - 2\,286 - 4\,463} = 410 \text{ x mil}$$

Aplicando las mismas definiciones y fórmulas, y haciendo la distinción por sexo, se obtuvieron los siguientes resultados:

Tasa de desempleo por sexo = D / (E+S+D)

Hombres:

$$\frac{249}{2\,964 + 1\,206 + 249} = 56 \text{ x mil}$$

Mujeres:

$$\frac{6\,849}{54\,870 + 14\,922 + 6\,849} = 89 \text{ x mil}$$

Tasa de desperdicio por sexo= (D+H+S) / (T- Es - I)

Hombres:

$$\frac{249 + 49 + 1{,}206}{4{,}868 - 289 - 111} = 336 \text{ x mil}$$

Mujeres:

$$\frac{6\,894 + 16\,922 + 14\,922}{99\,957 - 1\,997 - 4\,352} = 413 \text{ x mil}$$

Fuente: Datos generados por FUNSALUD a partir de los datos del XII Censo General de Población y Vivienda, 2000, México

El desperdicio de recursos humanos altamente calificados sin duda tiene un significado negativo en la economía de cualquier país. Los gobiernos y las familias invierten enormes cantidades de recursos materiales y financieros para formar profesionales que no se pueden ubicar en el mercado de trabajo y, por tanto, no pueden desempeñar las funciones para las que fueron educados durante largos periodos de tiempo.

En México no se ha documentado hasta el momento el costo que representa para el sector público la educación del personal de enfermería. Sin embargo, se puede tener una aproximación a este cálculo con base en la información disponible en otros países. De acuerdo con datos publicados recientemente, en 2005 el costo en una universidad pública equivalente a cuatro años de estudio en EUA es de poco más de 14 000 dólares al año, mientras

que el costo promedio en una universidad privada en este mismo país es de 30 000 dólares.[17]

Las tasas de desperdicio escolar en la licenciatura de enfermería, independientemente de sus variaciones, están relacionadas con factores tales como la carencia de una vocación bien cimentada, las dificultades para cubrir los gastos que implica la formación, motivos personales vinculados con periodos de reproducción o de enfermedad, tener responsabilidades escolares y laborales de manera simultánea, así como deficiencias pedagógicas por parte del personal docente.[18] Estas situaciones requieren de políticas concretas para hacerles frente, de tal manera que los estudiantes reciban información vocacional en el momento adecuado, así como garantizar apoyo financiero a aquellos que muestren alta capacidad académica.

Como se observa, las tasas de desempleo reflejan solamente una parte del fenómeno del desperdicio, ya que entre la población representan alrededor de 20% del conjunto de individuos que no pone en práctica los conocimientos adquiridos en la formación. Las tasas de desperdicio en el mercado de trabajo ofrecen una perspectiva más completa y resultan preocupantes, sobre todo al compararlas entre sexos, en donde la tasa alcanzada por las mujeres es 19% más alta que la registrada por los hombres. Si bien la enfermería es una ocupación predominantemente femenina, ello no significa que la situación de las mujeres en el mercado de trabajo sea mejor con respecto a los hombres. Gran parte de esta diferencia se explica por una visión estereotipada de las diferencias entre hombres y mujeres en el hogar y en la sociedad en general.[19]Aún cuando esta diferenciación se establece socialmente (en particularen el ámbito familiar), las instituciones educativas, desde el nivel básico hasta el universitario, tienen un papel que desempeñar en la modificación de esta tendencia, ya que las condiciones laborales actuales así lo demandan.

En un estudio previo sobre el desperdicio de médicos en el mercado de trabajo[12] se calculó una tasa de 241 por cada 1 000, la cual fue menor frente a las personas que estudiaron enfermería (410 por cada 1 000). Al comparar las tasas de desperdicio entre mujeres que cursaron medicina y las de licenciatura en enfermería se observa que éstas no son muy diferentes: entre las primeras fue de 341 por cada 1 000 y en las segundas de 413 por cada 1 000. Los resultados anotados podrían implicar que, independientemente del tipo de estudios que las mujeres realicen en el campo de la salud, los espacios del mercado no están totalmente disponibles para ellas. Para buscar reducir este fenómeno se requeriría de la intervención de otros actores con capacidad de articulación de intereses de diferentes sectores; en México, particularmente de la Comisión Interinstitucional para la Formación de Recursos Humanos para la Salud.

La construcción de las fórmulas y las tasas de desperdicio calculadas para los ámbitos de formación y el mercado de trabajo no se realiza para contrastarlas, sino más bien para buscar integrarlas. Por ejemplo, en el año 2000, de cada 1 000 estudiantes que ingresaron a la carrera en 1997, 294 no terminaron de estudiarla. Para ese mismo año podía considerarse que la capacidad de trabajo de 413 enfermeras de cada 1 000 graduadas se encontraba desperdiciada. Se trata de mostrar que en el primer campo muchos estudiantes desertan, lo cual obviamente implica la inversión de recursos económicos (individuales y sociales) para un propósito que no se logró. Mientras que en el terreno laboral existen amplios contingentes que luego de haberse graduado, no aplican los conocimientos acumulados en su formación escolar y se ocupan en actividades ajenas a su preparación. A diferencia del ámbito de la formación, en el mercado de trabajo es posible pensar que existen opciones para que los individuos ya formados se reintegren a él, aunque sea de forma parcial.

Si bien las estimaciones aquí presentadas sobre la estructura del mercado laboral son menos detalladas que las de otros estudios,[14,20] al menos nos permiten obtener una idea general e integrada (educación y mercado laboral) de la dimensión del desperdicio, lo cual para efectos de políticas de intervención representa una base de evidencia sólida. Es recomendable desarrollar políticas específicas para cada uno de los grupos incluidos en el desperdicio laboral; además, estos datos son reproducibles en muchos países, lo cual abre la posibilidad de desarrollar análisis comparativos en el ámbito internacional, lo que generalmente se dificulta por las diferencias entre el volumen y la calidad de la información disponible.

Conclusiones

- En México existe la percepción de una escasez de enfermeras profesionales. El aumento en el número de graduadas no resuelve el problema, ya que casi cuatro de cada 10 egresadas no se vinculan al mercado de manera adecuada. En este contexto, atender el desperdicio de la capacidad de recursos humanos es fundamental, ya que puede hacerse un mejor uso de los recursos que la sociedad utiliza para formar enfermeras. Este problema debe ser estudiado a detalle y bajo distintas perspectivas a fin de ofrecer a las instancias respectivas alternativas para su solución.

- Las diferencias de género en el desperdicio laboral son importantes, lo cual llama a la aplicación de políticas específicas, sensibles a las necesidades de las mujeres para incorporarse al mercado laboral correspondiente a su formación.
- Como parte del problema, debe considerarse la experiencia que los individuos tienen que enfrentar para incorporarse al mercado de trabajo, así como las barreras y las oportunidades para que ello suceda. Ante dicha situación, los sistemas de salud y de educación deberían coadyuvar en la reducción de este desperdicio, a través de una planificación que contribuya a equilibrar la oferta y la demanda de los recursos humanos, lo cual debe considerarse como un imperativo social.
- La metodología seguida para calcular el desperdicio, tanto en la formación como en el mercado de trabajo, demostró ser útil para apoyar este tipo de análisis. De esta forma, a partir de los datos de los censos de población y del manejo de variables similares, sería posible hacer una réplica del método en otros países con la intención de realizar estudios comparativos y complementarios que permitan conocer a mayor detalle el problema, y que den sustento al planteamiento de políticas alternativas dentro del sector salud.

Agradecimientos

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Educating skilled birth attendants in Mexico: do the curricula meet International Confederation of Midwives standards?*

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The estimated maternal mortality ratio in Latin America and the Caribbean is 190/ 100,000 live births, lower than in other developing regions of the world yet still unacceptably high, with broad inequalities across the region. Between 1990 and 2000 it remained unchanged.[1] Mexico, like other countries in the region, has made only minor improvements in the maternal mortality ratio since the Millennium Development Goals were signed, yet over 90% of births are attended by physicians and other skilled attendants. The principal causes of maternal deaths in Mexico are toxaemia and hypertensive disorders of pregnancy (32%), haemorrhage (22%), complications of the puerperium (10%) and abortion (8%).[2,3] Since 1990, maternal mortality has decreased in rural areas, but increased in urban areas; the highest rates are now found in states where 96±98% of deliveries are attended by skilled providers. While maternal mortality is a complex issue, this concentration of maternal deaths in areas well served by physicians raises concerns about the quality of training and subsequent care provided by them.

This study discusses the respective strengths and weaknesses of the educational programmes for three types providers of obstetric care in Mexico. These are professional midwives with a technical license, obstetric nurses and general physicians. Physicians with specialist training in obstetrics and gynaecology were not included because these providers have advanced training in obstetric care and do not attend the majority of births in Mexico. Ascertaining the quality of education is the first step in the assessment the potential of each of these groups of professionals to contribute to improvements in maternal and infant health in Mexico.

Background

The term "skilled attendant" refers to a health professional, whether midwife, nurse or doctor, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate post-partum period, and in the management or referral of complications in women and newborns. An investigation by the Pan American Health Organization (PAHO)[1] found that although approximately 75% of women giving birth in the region are attended by physicians, nurses and midwives who meet the definition of skilled birth attendant,[4] the fact that maternal mortality remains high probably indicates substandard care.

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Mexico is representative of the PAHO findings. The static nature of maternal mortality in Mexico in recent years and the need for skilled attendants, especially in rural and poor areas, has led to a national conversation about how best to meet women's needs. During the period 1994±1997, 61.5% of births were attended in the public sector, 21% in the private sector and 16% at home by midwives or other individuals.[2] Improvements in maternal mortality from the 1970s±80s were consistent with the increasing percentage of women attended by physicians and broad changes in the health care system.[5] Those changes included a 1968 decision that obstetric nurses would no longer attend deliveries in public hospitals and their place taken by physicians (Personal communication, Dr Patricia Uribe, Director, National Gender and Reproductive Health Center, Ministry of Health, Mexico, 8 May 2007). In 1974, 55% of births were attended by physicians and 40% by traditional midwives and nurses. By 1997, 82% of all deliveries in Mexico were attended by physicians and 15% by nurses or midwives. By 2002, 97% of births were attended by physicians, nurses or midwives,[2] but the moderately high maternal mortality ratio (64/100,000)[6] demonstrates that more work is needed if the Millennium Development Goals are to be met by 2015.[7]

There is rural±urban variation in those who provide obstetric care. Thirty-three per cent of deliveries in rural areas were attended by nurses or traditional midwives from 1994±97, compared with 15% for the country as a whole.[2] Discrepancies in skilled attendance at birth also exist between the wealthier northern regions and the poorer, southern rural areas. In some poorer states, only 50% of women have skilled attendance in pregnancy and birth, and more maternal deaths might be expected to occur in those areas. However, from 1990 to 2002 (the same period in which reduction in maternal mortality was stalled) the proportion of maternal deaths in urban areas increased from 54% to 64% while the proportion of rural deaths decreased from 46% to 36%.

These facts raise questions about the quality of obstetric medical education and care in Mexico. In particular, since young pre-graduate and newly graduated physicians are providing the majority of basic health care in rural communities, including obstetric care, their preparation for this work is critically important. Often they work alone and in settings with minimal supervision from general or specialised staff physicians.

In addition to the physicians who provide most of the obstetric care in Mexico, there are two types of non-physician obstetric providers also currently being trained to attend births: professional midwives and obstetric nurses. The leading institution for training and education of midwives, and the only school whose graduates receive technical licenses, is the CASA Professional Midwifery School (CASA), a private school run by CASA, a non-governmental organisation (bwww.casa.org.mxN). The school was launched in 1996 with the goal of producing young professionals with traditional and modern skills to work in rural areas. To date the graduates have been working independently for NGOs or in the private, not-for-profit hospital run by CASA. Graduates have also been hired by the government public health department in San Luis Potosi. There are five schools nationally that specialise in obstetric nursing,8 all of which focus on training women's health care clinicians to work primarily in a clinic or hospital setting, and all include education in direct provision of obstetric services.

The goal of this research was to analyse and compare the curricula of representative schools in Mexico for each of these three types of skilled birth attendant, and measured against the core competencies for skilled birth attendants as defined by the International Confederation of Midwives (ICM) and endorsed by the World Health Organization (WHO).[9] The core competencies for skilled birth attendants are the international standard for provision of skilled, safe, professional care to childbearing women and their families. They reflect the essential knowledge, skills and behaviours for a provider of antepartum, intra-partum, post-partum and neonatal care.

Methodology

The three representative education programmes, one for each provider type, were chosen with the assistance of the Mexican Ministry of Health and invited to participate. These were the CASA Professional Midwifery School in San Miguel de Allende, Guanajuato, UNAM School of Obstetric Nursing in Mexico City and UNAM School of Medicine, Iztacala Campus, also in Mexico City, which trains physicians. UNAM School of Medicine is the largest trainer of physicians in the country, with over 1,200 students completing their course of studies in 2003,[10] and representative of general medical training offered throughout Mexico. UNAMObstetric Nursing School, the largest in the country providing university-level training for obstetric nurses, had over 250 graduates in 2003. CASA Midwifery School accepted its first class in 1996 and in 2005, 15 students matriculated. CASA is much smaller than the other two programmes, but is the only

school for professional midwives that has appropriate governmental approval.

The protocol was approved by the ethics and research committees at the Mexican National Institute of Public Health and the University of California at San Francisco. Each institution was contacted and a meeting was arranged with key personnel, including the Deans and Directors, to inform them of the design and intent of the evaluation. A letter of agreement was signed, and a contact person in each institution was assigned to provide all written curriculum materials and supporting documents. Interviews were conducted with faculty and the deans of UNAM School of Medicine Iztacala, and UNAM School of Obstetric Nursing, as well as the Director and faculty of CASA Midwifery School.

The respective curricula were reviewed using quantitative methods with inclusion of information gathered from the interviews. The purpose of the review was to determine whether or not each programme's coursework contained critical elements necessary to provide proficient and humane independent labour and delivery care. A data collection tool was created based on the ICM Essential Competencies for Basic Midwifery Practice,[12] and included a list of the 214 competencies for skilled birth attendants adopted by WHO and the International Federation of Gynecologists and Obstetricians.[9] The 214 competencies are divided into six core competencies, each of which is divided into basic or additional knowledge and skills:

- general social sciences, public health skills and ethics;
- health education and services to promote healthy family life;
- antenatal care;
- labour and delivery care and emergencies;
- post-natal care;
- care from birth to two months of age.

It is expected that the basic knowledge and skills are applicable to all settings and the additional knowledge and skills can be adapted according to the specifics of each health system (see Table 1).

The two principal investigators (Walker, Cragin) and an additional expert carried out a comprehensive review of the documents provided by the three schools. All had relevant qualifications and experience, including in design and evaluation of curricula for nurse midwifery education, participation in medical, public health and nursing education, and current obstetric and nurse±midwifery practice. Each was given primary responsibility for the evaluation of one of the school's documents.

After the initial reviews were completed, the group met to cross check for items not found by the initial reviewer. The forms were evaluated for the inclusion or omission of each specific competency. The three reviewers came to agreement on preliminary scores for each institution. After the initial review was completed, each institution was sent a list of missing data and asked to provide, if possible, documentation of the missing content. Any additional documents provided by the institutions were then subject to the same process of review before a final score was calculated for each institution.

Results

Overall results of the curricular review are presented in Tables 1 and 2. Table 1 contains the score for each institution by competency. Table 2 contains the scores for overall knowledge and skills for each institution. Each programme is described in detail below.

UNAM School of Medicine

The school accepts students with high school (grade 12) education to matriculate for the sixyear medical school programme based on qualifying entry examinations. The first two years consist of classroom-based learning in the basic medical sciences followed by clinic/hospitalbased training in years three and four. This includes a six-week maternity rotation. The fifth year is an internship rotating between the different services of one hospital or clinic, and during the sixth year students are required to complete a year of social service *(pasante year)* comprised of clinical work in an assigned hospital, clinic or institution. Responsibility for and exposure to maternity care depends upon the type of services provided at the institutions in which students work.

Strengths

Iztacala's curriculum uses an innovative approach which integrates basic science theory with corresponding clinical applications using a systems approach. The curriculum prepares generalist physicians. The basic science perspective is strong, with 100 credits devoted to coursework in this area. Programme objectives include the concept of "working partnership with patients". The public health perspective is well defined and documented.

Table I. The scores for each institution by number of competencies taught in six main types of competency (n=number of competencies taught)

Competencies	Total number of competencies	UNAM Obstetric Nursing School	CASA Midwifery School	UNAM School of Medicine
Overall framework for decision-making in midwifery care	5	50% (n=2.5)	80% (n=4)	50% (n=2.5)
1. Requisite knowledge and skills from the social sciences, public health and ethics that form the basis of high quality, culturally relevant, appropriate care for women, newborns and childbearing families	23	61% (n=14)	91% (n=21)	35% (n=8)
2. Provision of high quality, culturally sensitive health education and services to all in the community in order to promote healthy family life, planned pregnancies and positive parenting	22	55% (n=12)	95% (n=21)	68% (n=15)
3. Provision of high quality antenatal care to maximise the woman's health during pregnancy and that includes early detection and treatment or referral of selected complications	57	54% (n=31)	91% (n=52)	58% (n=33)
4. Provision of high quality, culturally sensitive care during labour, conduct a clean and safe delivery, and handle selected emergency situations to maximise the health of women and their newborn	58	53% (n=30.5)	77% (n=44.5)	33% (n=19)
5. Provision of comprehensive, high quality, culturally sensitive postnatal care for women	24	35% (n= 8.5)	83% (n=20)	33% (n=8)
6. Provision of high quality, comprehensive care for the essentially healthy infant from birth to two months of age (25 competencies)	25	68% (n=17)	64% (n=16)	28% (n=7)
Summary score	**214**	**54% (n=115.5)**	**83% (n=178.5)**	**43% (n=92.5)**

Table 2. The scores for overall basic and additional knowledge and skills for each institution (n= number of variables taught)

	Total number of variables[a]	UNAM Obstetric Nursing School	CASA Professional Midwifery School	UNAM School of Medicine
Basic knowledge	79	59% (n=47.5)	93% (n=73.5)	60% (n=46.5)
Additional knowledge	14	39% (n=6)	71% (n=10)	43% (n=5.5)
Basic skills	80	64% (n=28)	86% (n=68.5)	36% (n=51)
Additional skills	36	31% (n=8)	60% (n=21.5)	22% (n=11)

[a] This list does not include the five competencies that comprise the overall framework for decision-making in midwifery care that are included in Table 1.

Limitations

This programme prepares generalists, and the content specific to the core obstetric competencies is limited and non-specific. Only 92.5 of the 214 indicators of necessary knowledge and skills for skilled birth attendance could be documented. The programme did not include coursework in psychology or mental health except for a module pertaining to substance abuse, and this was limited to alcoholism.

We were unable to verify that UNAM School of Medicine has any requirement for the type and number of supervised clinical experiences necessary for the development of the skills in the ICM Core Competencies. Neither a register of clinical experiences nor a standard

for minimum experiences were found in the programme materials. Without these, we could not determine whether students were required to have a minimum number of supervised clinical experiences in obstetrics prior to graduation. During the interview with the Dean and faculty, a clear concern about the limited number of appropriate obstetric clinical sites was voiced. The quality of students' clinical preparation in obstetrics is entirely dependent upon the experiences available in each clinical site. The sites are assigned by lottery without regard to student interest in any given specialty.

UNAM School of Medicine graduate doctors are expected to provide a full range of women's health care services during the pasante year, including skilled birth attendance. The analysis leads to the conclusion that the curriculum lacks sufficient depth of theory and supervised clinical coursework to prepare physicians as skilled attendants at birth. Most remarkably, only six weeks of the five years are spent in obstetric rotations. The *pasante* year, in which the generalist students are expected to manage independently after a short period of orientation, lacks the type of close mentoring and follow-up necessary for the type of ongoing skill acquisition that results in proficient knowledge and safe obstetric practice.

UNAM Obstetric Nursing School

Obstetric nurses attend a five-year university programme. They are admitted after high school (grade 12), based on a competitive examination. The programme is comprised of four years of basic nursing training. The first two years consist of an overview of nursing practice and basic courses in anatomy, physiology and development. The third year is devoted to the nursing process and practice across the life span. The fourth year is focused on obstetrics and the final year is dedicated to social service. UNAM Obstetric Nursing School trains the majority of obstetric nurse graduates in Mexico, an of average 250 per year.[11]

Strengths

The curriculum showed a strong focus on nursing theory, public health, psychosocial aspects of health, and maternal±child health education, including preparation for delivery, community health and home care. The programme had welldefined theoretical modules on the fetal-toneonate transition, well baby care and patient education. Required clinical practice experiences include: insertion of IUDs immediately postpartum, nursing care of women in labour, nursing care of labour inductions, management of normal delivery, nursing care of patients in prenatal clinics, home visits, nursing care of the newborn (normal and high risk), and teaching childbirth education classes. Nursing actions are comprised of dependent (upon the orders of physicians) and interdependent (tasks that have been agreed to be within the scope of practice of a nurse) functions.

Limitations

Materials provided by the UNAM Obstetric Nursing School documented only 115.5 of the 214 indicators of necessary knowledge and skills. The curricular material provided did not include written material covering the content of the last semester of year four, during which management of obstetric complications is covered. An e-mail from the UNAM Obstetric Nursing School faculty asserted that this last semester addressed many of the missing core competencies, however no curricular documentation was provided for confirmation.

Courses are generally identified as "nursing care of" and do not emphasise independent management skills with respect to the process of data collection, assessment and diagnosis, plan of care (including consultation, collaboration and/ or referral) or follow-up for ante-partum, intrapartum and post-partum care, family planning and newborn care. Since nurses "with training in obstetrics" are considered skilled providers by WHO and counted as such by the government of Mexico, it is important that they be provided with theoretical preparation and a decisionmaking framework for independent practice.

As with UNAM School of Medicine, numbers of required clinical experiences were not specified. Documentation of specific types of clinical experiences is not required and if gathered is kept by individual instructors. No documentation was provided to clarify whether students were given sufficient opportunities to acquire the skills defined by ICM. The curriculum does not articulate the process for teaching the degree of autonomy, independent problem-solving, critical thinking and inter-professional relationships that should be inherent in the role of obstetric nurse. Difficulty in obtaining appropriate and adequate clinical training sites was also voiced as a concern of the faculty and Dean at the Obstetric Nursing School.

UNAM Obstetric Nursing School devotes the last year of education and training to obstetrics. This concentration provides time for in-depth maternal health content and clinical training. The lack of availability of clinical experience

in sites which promote independent management skills severely limits the number of graduates who can attain proficiency, however. We estimated that while UNAM Obstetric Nursing School graduates 250 students a year, only 50 have supervised clinical experience that supports autonomous practice upon graduation. There is insufficient documentation as to whether the graduates have the skills necessary for managing low risk ante-partum, intra-partum and postpartum care or of providing initial management, consultation and referral in emergency or high risk situations.

CASA Professional Midwifery School

Students are required to complete a secondary school (grade 9) education and pass an admission examination and interview prior to admittance. This three-year midwifery programme is comprised of a first year of basic sciences, a second year of nutrition, pharmacology, health education and introductory obstetrics courses, and a third year of advanced obstetric pharmacology and neonatal course work. Each year students are expected to participate in clinical care provided at the CASA hospital, which provides almost exclusively obstetric services.

Strengths

CASA represents a comprehensive programme that devotes three years to preparing graduate midwives, incorporating 83% of the ICM competencies. The programme provides a good base of health care sciences in the first year and then devotes the rest of the content to the acquisition of women's health care knowledge and skills, including advocacy, health education and culturally relevant care. The curriculum is womanand family-centred.

CASA scored the highest in the quantitative analysis, meeting 178.5 of the 214 specific Know edge and skill requirements. The curriculum is modelled after the Midwives Association of North America core competencies, which are similar to the WHO core competencies for skilled birth attendants. Theory and practical experience pertinent to ante-partum, intra-partum, post-partum care for the woman, and for the infant delivery, newborn and well baby care are integrated over the entire three-year period. The theory and clinical coursework progress in a logical manner from a foundation of basic science pertinent to maternal and child health, and include psycho-social issues, community health, culture, customs and traditional midwifery practices.

Unlike the curricula at the School of Obstetric Nursing and the Medical School, curriculum review revealed an emphasis on teamwork and interpersonal relationships. Senior students support junior students and all participate in community building with outside midwives. Clinical experiences include home and hospital settings. Until recently, the CASA hospital provided all hospital-based clinical training. Since July 2006, public hospitals also provide training. Clinical objectives are specified along with recommended numbers of experiences. The programme fosters teamwork and inter-personal relationships.

Limitations

There was limited content pertaining to high-riskobstetric management. Pharmacology course content pertinent to women's health was not explicitly defined in the courses. The objectives did not explicitly incorporate a sequential process of critical thinking as a framework for consultation, co-management and referral in high risk situations. CASA's greatest limitation may be its capacity. Unlike the volume of graduates produced by the Obstetric Nursing and Medical Schools, CASA has not had a graduating class larger than 10 students. This small class size allows for more hands-on experience but limits its ability to meet an increasing demand for trained professional midwives.

Discussion

In addition to the infrastructure needed for any type of safe obstetric care, the ability of skilled attendants to provide safe and humanistic care begins with their basic education and training. Without an education that includes both a didactic structure for learning the core scientific concepts of maternal and newborn care and the supervised clinical experiences necessary to attain the important skills, it is unlikely that an individual will be able to practise safely.

Each programme represents a unique approach to preparing skilled birth attendants, with varying degrees of accordance with required competencies as outlined by ICM. Thorough and impartial curriculum analysis depends on the ability to review very specific course goals and objectives with accompanying lecture and seminar content guides that together cohesively reflect and articulate the goals and objectives. While the missing content and activities may actually be included by all three programmes, the documentation was not always available in the materials provided, especially by UNAM Obstetric Nursing School and UNAM School of Medicine.

It is important to recognise that while CASA Midwifery School aims exclusively to prepare midwives to provide maternity care, UNAM School of Medicine and UNAM Obstetric Nursing School are graduating generalist physicians and nurses who require a range of skills for a variety of clinical situations apart from obstetrics, and both have curricula with clinical experiences that provide a good foundation for generalist nursing and medical practice.

In our evaluation, we sought documentation that verified the didactic structure and supervised clinical experiences for core and advanced midwifery knowledge and skills. WHO recognizes the need to require those receiving a general nursing or medical education to have "specialist education and training, either during their preservice education or as part of a post-basic programme of studies".[9] However, the documentation provided by these programmes did not demonstrate the additional training needed to be able to manage "normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns".[9]

Our evaluation demonstrates the need for improvements in the nursing and physician curricula to meet these requirements. Specifically, the nursing curriculum should focus on providing a foundation for independent clinical care. Basic and advanced clinical competencies should be defined and evaluated in a systematic manner. The number and type of clinical experiences leading to clinical competence should be documented. Coursework in life-saving skills for obstetric emergencies should be developed.

While each school must evaluate which of the competencies included under additional knowledge and skills ought to be in their curricula, those related to the prevention and identification, and treatment, stabilisation or referral of life-threatening conditions must be included. For example, none of the curricula contained content about active management of the third stage of labour nor discussed how to evaluate and use appropriate consultation or referral to the next higher level of care.

Stuart Franklin/Magnum Photos

A nurse struggles to care for newborn babies in a post-natal ward, México City, 1990

Future horizons for skilled birth attendants in Mexico

New physicians, even though they have finished their medical school course work, have limited supervised clinical training before their placement in rural communities. These new providers are frequently of a different social and linguistic background than the patients they serve or the traditional midwives who bring women to them. They work in situations of scarce material resources and without easy access to expert consultation and back-up for the high risk conditions they may encounter. These factors, in addition to the limitations found in the curriculum, hamper their effectiveness.

Evidence shows that nurses with midwifery skills and professional midwives can and do provide a high quality of maternity care in Mexico,[12] oftentimes to women from poor and vulnerable populations.[13] However, in Mexico there are currently barriers to practise for both these types of skilled providers that must be addressed.

The issues facing obstetric nursing in Mexico are complex and multi-level. Entry paths into nursing are diverse and unemployment rates are high, further complicating the discussion. While nearly 62% of nurses in Mexico have university training[14] nearly 50% of them are not employed.[15,16] Early in 2005, the Secretary of Health re-opened obstetric nursing positions in public hospitals, recognising that universitytrained obstetric nurses have the potential to have a positive impact on the quality of labour and delivery care. The administrative details for implementing this new policy are still being refined. However, as we found, since pre-service clinical practice sites are extremely limited, due to resistance by hospital directors to nurses attending deliveries, it may be many years before a sufficient number of qualified obstetric nurses graduate to fill these positions. Creating job opportunities within hospitals will help address one of the many barriers to nurses working as skilled birth attendants.

Official acceptance of professional midwives has been difficult as traditional midwives who had no formal training are characterised in negative ways, ranging from ill-prepared and therefore dangerous, to superfluous to the health care system. Since post-partum haemorrhage and eclamp-

sia are leading causes of maternal mortality, solutions aimed at improving the infrastructure so that rural women have rapid access to medical care are seen by some as more relevant than promoting the newer professional midwives to work in rural areas in the health care system.

While graduates of CASA have a historic connection to traditional midwives, their education and training provides the necessary level of knowledge and skills to enable them to be included in the ranks of skilled professionals at birth. This curriculum could be improved by strengthening aspects of pharmacology, increasing emphasis on emergency management, and providing explicit content on consultation with other members of the health care team, including negotiation skills and knowledge of scope of practice for each member of the team.

Professional midwives, in particular, may provide both a medically sound and culturally sensitive option in needy rural settings. However, professional midwives face many of the same obstacles facing obstetric nurses, including limited access to clinical practice sites, resistance by the medical establishment and few options for long-term steady employment, as the Secretary of Health does not have positions for midwives in public hospitals.

Implementation of a system of care that includes non physician skilled attendants requires that policymakers at all levels of government support the necessary infrastructure changes. The Mexican Ministry of Health has taken two important steps in this direction by opening places for obstetric nurses and by providing the necessary approvals for CASA midwifery graduates to do their social service year in public hospitals. The next step for the Ministry is to begin to employ professional midwives and obstetric nurses in rural health clinics andmarginalised urban clinics with a maternal death ratio above the national average. This intervention must be critically and rigorously evaluated in order to obtain evidence of its effectiveness, and if effective, the Ministry should support the opening of more professional midwifery schools.

We recommend that professional midwives and obstetric nurses should be formally integrated into the public health system to attend deliveries. To ensure the long-term success and sustainability of this policy, legislation is needed that defines an independent scope of practice for professional midwives and obstetric nurses, allowing them to care for women of childbearing age under their own licenses. The positions of professional midwife and obstetric nurse must be incorporated into the hospital staff registry and supported financially, both to legitimise them as professionals and facilitate hiring. Existing referral networks need to be strengthened and, as with any strategy to combat maternal mortality, the use of non-physician providers should be tailored to the setting, reflecting the distinct needs of urban vs. rural areas, and the physical and human resource differences between hospitals and clinics.

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Prescripción, acceso y gasto en medicamentos entre usuarios de servicios de salud en México*

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El acceso a los medicamentos representa uno de los retos más importantes para los sistemas de salud,sobre todo en los denominados países en desarrollo. Se estima que 75% de la población mundial, concentrada en estos países, tiene acceso a sólo 25% de la producción global de medicamentos.[1] Asimismo, la mayoría de los sistemas de salud en dichos países enfrentan problemas para disponer de la cantidad suficiente de medicamentos de buena calidad, en una presentación adecuada y al menor costo posible, así como para lograr su utilización en forma racional.[2] Al respecto, diversos autores[3-5] han referido el abuso en la prescripción de antibióticos y otros medicamentos para el tratamiento de los problemas de salud que generan mayor demanda de los servicios médicos de primer nivel de atención, es decir, para las infecciones respiratorias agudas y las enfermedades diarreicas. Una de las consecuencias inmediatas de la prescripción inapropiada de medicamentos, además del eventual riesgo para la población usuaria, es el incremento del costo de la atención médica. Sin embargo, los médicos toman poco en consideración la información relacionada con el costo de los medicamentos que prescriben, o la desconocen.[6]

Si bien la formación técnico científica de los médicos ha sido señalada como una de las variables que influyen en la conducta prescriptiva,[7,8] se cuenta también con evidencias respecto a otras variables que pueden contrabalancear esta influencia, como son la presión de los familiares del paciente para obtener una prescripción; la necesidad de los médicos de satisfacer las expectativas de sus pacientes; la influencia de factores institucionales, tales como las normas de los programas o la disponibilidad de medicamentos, y el rol de la información de las compañías farmacéuticas, entre otros.[9] De esta forma, es frecuente que los médicos se vean en la disyuntiva de prescribir, y así satisfacer las expectativas de los pacientes o la demanda de sus familiares aunque, la prescripción no se justifique médicamente, o bien, de no prescribir cumpliendo con las normas de determinados programas, y no satisfacer las expectativas de sus pacientes.

En México los servicios de salud se encuentran organizados en tres grandes grupos de instituciones: seguridad social, asistencia social e instituciones médicas privadas. Las unidades de atención de las instituciones de seguridad social y asistencia social cuentan con una farmacia propia que, hipotéticamente, debería dispensar la totalidad de los medicamentos prescritos, siempre que estén incluidos en la lista del Cuadro Básico de Medicamentos (CBM);[10] éstos corresponden a presentaciones de medicamentos

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genéricos. Cuando los prescritos no están considerados en el CBM, éstos se adquieren en las farmacias privadas mediante elpago directo del usuario, o bien, con cargo a la institución de seguridad social correspondiente, para lo cual se debe justificar su necesidad médica.

Los usuarios (derechohabientes) de las instituciones de seguridad social cuentan con un seguro prepagado por los trabajadores, las empresas y el Estado, que cubre al trabajador y a su familia, e incluye los gastos de atención médica, estudios de laboratorio y gabinete, así como los medicamentos prescritos por los médicos en estas instituciones. En el caso de los usuarios de las instituciones de asistencia social, los servicios médicos de primer nivel de atención se plantean como gratuitos, es decir, sin pago directo por el usuario, aun cuando el conjunto de los ciudadanos aportan al pago de estos servicios mediante los impuestos.[11] Sin embargo, esta forma de acceso a los servicios médicos no incluye necesariamente ni los medicamentos ni los estudios de laboratorio; en estas instituciones el acceso a los medicamentos está regulado por normas y criterios establecidos tanto por las instituciones de saludcomo por los gobiernos de los estados.[12]

En 1994 se realizó la Encuesta Nacional de Salud II (ENSA-II) con el propósito de analizar, entre otras cosas, la situación de salud y la utilización de los servicios de salud públicos y privados en México. Esta encuesta obtuvo información sobre la prescripción, el acceso y el gasto en medicamentos entre los usuarios de servicios públicos y privados de salud, siguiendo tres preguntas guía: "¿A quiénes se les prescribió medicamentos? ¿Obtuvieron los medicamentos prescritos? ¿Cuánto gastaron en medicamentos por evento atendido?" Basado en la ENSA-II, este trabajo tiene como propósito analizar las características de la prescripción, el acceso y el gasto en medicamentos, según variables demográficas y socioeconómicas de los usuarios, así como de las instituciones de salud donde fueron atendidos.

Material y Métodos

Se analizaron la prescripción, el acceso y el gasto en medicamentos a partir de la muestra nacional de usuarios (*n*=3 324) de los servicios públicos y privados de salud obtenida por la ENSA-II, 1994. La prescripción se refiere a la indicación de medicamentos al usuario por un médico, una enfermera o un odontólogo. La encuesta no obtuvo información sobre el tipo ni la cantidad de medicamentos prescritos. El acceso se comprende como la obtención, con o sin pago directo por el usuario del medicamento prescrito. El gasto en medicamentos se entiende como la cantidad de dinero pagada por el usuario para la obtención de los mismos. Las estimaciones del gasto en medicamentos se realizaron tomando en consideración la equivalencia del peso(moneda nacional) respecto al dólar americano; se tomó el tipo de cambio en 3.20 pesos por 1.00 dólar, que correspondió al periodo de la encuesta, es decir, de la última semana de abril a la última de julio de 1994.

La prescripción, el acceso y el gasto en medicamentos fueron analizados según edad del usuario, tiempo de evolución de la enfermedad (<1 mes/> 1 mes), institución que brindó la atención (Seguridad Social,* Secretaría de Salud ±SSA±, otras instituciones públicas[⊠] e instituciones privadas); tipo de servicio utilizado (curativo/preventivo); condición de aseguramiento (derechohabiente/no derechohabiente de la seguridad social); lugar de obtención de los medicamentos (farmacia privada/lugar de atención); lugar de residencia (urbano/rural), región sociodemográfica, y nivel socioeconómico. En el caso de la variable región sociodemográfica[§] se establecieron cinco zonas[13] con base en dos criterios principales: uno geopolíticoadministrativo, que agrupó diversos estados del país y fue utilizado para definir las regiones Norte, Centro, Sureste/Golfo y Zona Metropolitana de la Ciudad de México (ZMCM), y otro criterio socioeconómico que incluyó los estados con mayor índice de pobreza en el país, los que fueron agrupados en la región PASSPA, debido a que eran beneficiarios del Programa de Asistencia Social para Areas Marginadas. Para establecer el nivel socioeconómico de los usuarios, la ENSA-II elaboró un índice con las siguientes variables: características de la vivienda (materiales utilizados en la construcción del piso, paredes y techo); disponibilidad de servicios de la vivienda (cuarto para cocinar, drenaje, retrete, agua entubada) y disponibilidad de algunos satisfactores (televisión, videocasetera, refrigerador, estufa de gas, calentador de gas, automóvilo motocicleta). Para cada una de estas variables se determinó un ponderador de acuerdo

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⊠ Departamento del Distrito Federal Sistema Nacional para el Desarrollo Integral de la Familia Instituto Nacional Indigenista Instituto Mexicano del Seguro Social-Solidaridad

§ Norte: Baja California, Baja California Sur, Sonora, Chihuahua, Sinaloa, Coahuila, Nuevo León, Tamaulipas, Durango y Zacatecas Centro: San Luis Potosí, Guanajuato, Querétaro,Michoacán, México, Tlaxcala, Nayarit, Aguascalientes, Jalisco y Colima ZMCM: Distrito Federal y jurisdicciones conurbadas PASSPA: Hidalgo, Oaxaca, Guerrero y Chiapas Sureste/Golfo: Morelos, Puebla, Veracruz, Campeche, Tabasco, Yucatán y Quintana Roo

con el número de casos que presentó cada una de las características descritas; con ello se obtuvo una escala continua que posteriormente se categorizó por cuartiles, donde el cuartil inferior representó a los usuarios de servicios de salud con malas condiciones socioeconómicas (nivel bajo), y los siguientes cuartiles correspondieron a los niveles medio, regular y alto.[13]

El análisis comprendió la descripción de las variables de interés (prescripción, acceso, gasto en medicamentos) y algunas características asociadas; se efectuaron pruebas de hipótesis con X^2 y se construyó un modelo de regresión logística múltiple14 para identificar las características asociadas con la prescripción médica en términos de razones de momios, incluyendo como covariables la edad (0-4, 5-14, 15-44, 45-64 y 65 o más años); el tipo de servicio (preventivo y curativo); el tipo de institución (seguridad social, otras instituciones públicas, SSA e instituciones privadas), y la región (PASSPA, Norte, Centro, ZMCM y Sureste/Golfo). El gasto en medicamentos se describió mediante la mediana, debido al sesgo de la distribución del gasto, y se evaluaron las diferencias de las medianas pormedio de la prueba de suma de rangos de Wilcoxon para dos muestras independientes.

Resultados

Prescripción de medicamentos

Del total de usuarios de los servicios de salud entrevistados (*n*=3 324), a 78% le recetaron medicamentos. El grupo de usuarios de 65 años y más de edad fue el que presentó un mayor porcentaje de prescripción de medicamentos (93%), y el grupo de menores de cinco años de edad fue el que recibió la menor prescripción (66%). Según el tipo de servicio utilizado, 93% de los usuarios de servicios curativos y 32% de los usuarios de programas preventivos recibieron prescripción de medicamentos (p <0.001). En relación con la institución que brindó la atención, las privadas presentaron el mayor porcentaje de usuarios con prescripción (87%), aproximadamente 20% más que en la SSA, que fue la institución con menos prescripción a los usuarios (p<0.001). No se presentaron diferencias estadísticamente significativas en la prescripción de medicamentos entre los usuarios de localidades urbanas y rurales.

En el modelo de regresión logística para prescripción de medicamentos, tomando como referenciaa los menores de cinco años de edad, la frecuencia relativa de usuarios con prescripción fue 1.6 veces mayor en el grupo de 45 a 64 años, y dos veces más en los de65 y más años de edad. Según el tipo de servicio utilizado, la frecuencia de usuarios con prescripción atendidos en servicios curativos fue 25 veces mayor que la de los atendidos en programas preventivos. Por institución donde se atendió, la frecuencia de usuarios con prescripción fue el doble en las instituciones privadas respecto a la de las instituciones de seguridad social. En el ámbito regional, los usuarios de la región Sureste/Golfo recibieron mayor prescripción de medicamentos respecto a los de la región PASSPA (cuadro I).

Acceso a los medicamentos

Del total de usuarios a quienes se les prescribieron medicamentos (*n*=2 591), 97% los obtuvo todos, y 3%, sóloalguno o no los consiguió. De los usuarios que los obtuvieron, 61% los consiguió en el establecimiento donde fue atendido o en otra unidad de la misma institución, y 39%, en las farmacias privadas.

Cuadro I. Razones de momios e intervalos de confianza para prescripción de medicamentos en usuarios de los servicios de salud.* México, 1994

Factores	RM§	IC RM (95%)
Grupo de edad (años)		
0-4‡	1.00	
5-14	0.82	0.57 – 1.18
15-44	1.31	0.98 – 1.75
45-64	1.61	1.05 – 2.47
65 y más	2.07	1.18 – 3.61
Tipo de servicio		
Preventivo‡	1.00	
Servicio curativo	25.25	19.93 – 32.00
Tipo de institución		
Seguridad social	1.00	
Otras instituciones públicas	1.00	0.62 – 1.62
SSA	0.93	0.70 – 1.24
Privadas	2.06	1.54 – 2.74
Región		
PASSPA‡	1.00	
Norte	1.11	0.78 – 1.59
Centro	1.23	0.85 – 1.79
ZMCM	0.91	0.62 – 1.33
Sureste-Golfo	1.64	1.12 -2.39

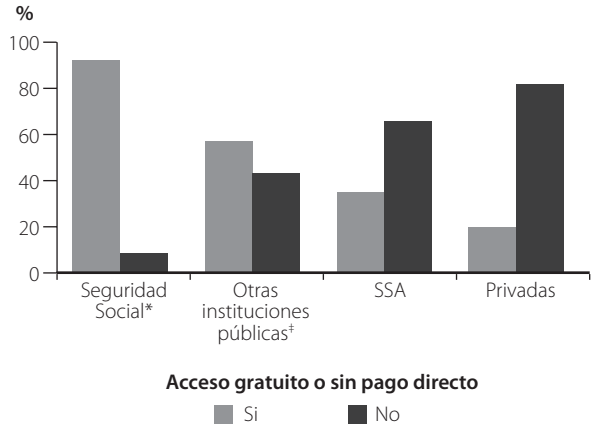
* Derivado del análisis de regresión logística múltiple
‡ Categoría de referencia
§ RM= razón de momios

Fuente: Encuesta Nacional de Salud II, México, 1994

Según instituciones, 91% de los usuarios de la seguridad social y 46% de los usuarios de la SSA obtuvieron los medicamentos en la farmacia de la institución. En el caso de los usuarios de instituciones privadas, 38% obtuvo el medicamento en el establecimiento donde fue atendido, y 62%, en las farmacias privadas.

Del total de usuarios con prescripción, 52% contestó que no pagó por los medicamentos prescritos; su distribución, según instituciones, se presenta en la figura 1. El 92% de los usuarios de la seguridad social contestaron que no pagaron adicionalmente por los medicamentos obtenidos. En el caso de las instituciones de asistencia social, sólo una tercera parte de los usuarios de la SSA y más de la mitad de los de otras instituciones públicas mencionaron no haber pagado por los medicamentos, mientras que entre los usuarios de las instituciones privadas la proporción fue de 19%.

En el ámbito regional, los usuarios de la región PASSPA presentaron la menor proporción entre los que no pagaron por los medicamentos (41%), mientras que los de la región Norte tuvieron el mayor porcentaje (62%) (p<0.001). Según el nivel socioeconómico, 56% de los usuarios con nivel alto recibieron los medicamentos sin pago directo, mientras que esto ocurrió sólo para 45% (p<0.001) de aquellos con nivel socioeconómico bajo. Asimismo, fue mayor el porcentaje deusuarios de áreas urbanas (55%) que obtuvieron sus medicamentos sin pago directo que los de áreas rurales (46%) (p<0.001).



* IMSS, ISSSTE, Marina Defensa, Pemex
‡ IMSS Solidaridad, DIF, DDF, INI

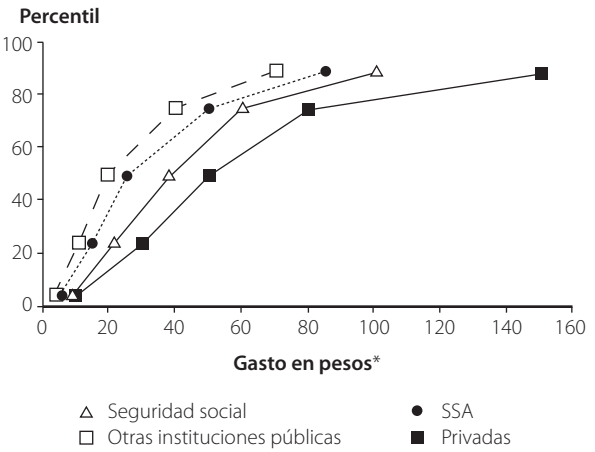
Fuente: Encuesta Nacional de Salud II, México, 1994

Figura 1. Porcentaje de usuarios de servicios de salud que obtuvieron los medicamentos sin pago directo, según instituciones. México, 1994

Gasto en medicamentos

En este apartado se analiza exclusivamente la información de aquellos usuarios que notificaron haber pagado por los medicamentos, los cuales representaron 48% de los que recibieron prescripción. De éstos, 64% correspondió a usuarios de instituciones privadas, y 36%, a usuarios de instituciones públicas, principalmente de asistencia social (SSA, Departamento del Distrito Federal, Sistema Nacional para el Desarrollo Integral de la Familia, Instituto Nacional Indigenista). El gasto medio en medicamentos por evento atendido, en los 15 días previos a la encuesta, fue de 64.44 pesos (20.13 dólares) con un mínimo de 2.00 pesos y un máximo de 1 120.00 pesos; la mediana correspondió a 40.00 pesos (12.50 dólares). La figura 2 muestra la distribución porcentual acumulada de los usuarios que pagaron por los medicamentos, según institución donde se atendieron.

El cuadro II presenta las medianas de gasto en medicamentos según la institución donde se atendieron los usuarios, el nivel socioeconómico, la región sociodemográfica y el lugar de residencia. La diferencia de medianas



* Tipo de cambio en abril-julio de 1994, 3.20 pesos = 1.00 dólar

Fuente: SSA, Encuesta Nacional de Salud 11, 1994

Figura 2. Porcentaje acumulado de gasto en medicamentos entre usuarios que pagaron por los medicamentos obtenidos, según instituciones. México, 1994

del gasto en medicamentos fue mayor para los usuarios de instituciones privadas respecto a losde las públicas (seguridad social, SSA, otras instituciones públicas) (p<0.05). Según el nivel socioeconómico, los usuarios con nivel alto presentaron una diferencia mediana de gasto significativa

Cuadro II. Mediana de gasto en medicamentos entre usuarios de servicios de salud,[§] según variables socioeconómicas, demográficas y por instituciones de salud. México, 1994

Variable	Mediana de gasto		Significancia estadística
Institución	**Pesos**	**USD***	
Seguridad social	38.5	(12.4)	p<0.05
Otras instituciones públicas de salud	20.0	(6.4)	p<0.001
SSA	25.0	(8.0)	p<0.001
Instituciones privadas[‡]	50.0	(16.1)	
Región sociodemográfica			
Norte (región I)	44.0	(14.1)	p>0.50
Centro (región 2)	37.5	(12.1)	p>0.10
Zona metropolitana De la Ciudad de México ZMCM (región 3)	49.5	(15.9)	p>0.10
PASSPA (región 4)[‡]	45.0	(14.5)	
Sureste (región 5)	38.5	(12.4)	p>0.10
Índice socioeconómico			
Bajo (nivel 1)	40.0	(12.9)	p<0.001
Medio (nivel 2)	40.0	(12.9)	p<0.001
Regular (nivel 3)	40.0	(12.9)	p<0.001
Alto (nivel 4)[‡]	50.0	(16.1)	
Lugar de residencia			
Rural	40	(12.9)	p<0.05
Urbano[‡]	39.5	(12.7)	

* Tipo de cambio: 3.20 pesos = 1.00 dólar
[‡] Categoría de referencia
[§] Incluye exclusivamente a los usuarios que pagaron por medicamentos

Fuente: Encuesta Nacional de Salud II, México, 1994

respecto a los de otros niveles socioeconómicos (p<0.001). Por región sociodemográfica, los usuarios de la ZMCM presentaron la mayor mediana, y la menor correspondió a los de la región Centro sin mostrar diferencias significativas; según el lugar de residencia, el gasto fue ligeramente mayor entre usuarios de áreas rurales que de urbanas.

Discusión

La información obtenida por la ENSA-II cumple con el propósito de identificar las características demográficas, socioeconómicas y de atención médica de los usuarios de los servicios de salud; en este marco, el presente trabajo describe las características de la prescripción, el acceso y el gasto en medicamentos. Respecto a la prescripción de medicamentos, era obvio esperar una mayor frecuencia de usuarios con prescripción entre aquellos que utilizaron servicios curativos respecto a los que recurrieron a los preventivos. No obstante, una importante proporción de usuarios de programas preventivos informó que le habían prescrito medicamentos; estos usuarios podrían corresponder a los de programas de inmunización y de planificación familiar, principalmente.

Respecto a la relación entre prescripción de medicamentos y grupos de edad, la asociación de las dos variables está documentada; hay mayor frecuencia de prescripción en el grupo de mayor edad (65 y más años) respecto a los grupos de menor edad,[15] este hecho podría estar relacionado con las presiones de los propios usuarios de los servicios de salud, con los problemas por los que demandan los servicios, así como con las actitudes de los médicos respecto al tratamiento para este grupo de población.[16] La elevada prevalencia de las llamadas enfermedades crónico-degenerativas y el conjunto de síntomas que las acompaña justifica y conduce a una práctica médica que coloca en un plano secundario el manejo fisioterapéutico o de rehabilitación frente a la prescripción de medicamentos.[17] Sin embargo, la ENSA-II no recogió información respecto a la cantidad y el tipo de medicamentos prescritos, por lo cual no fue posible profundizar en este análisis. Por lo mismo, tampoco contamos con una explicación satisfactoria, derivada del análisis de la información obtenida, sobre por qué fue mayor la frecuencia de usuarios de instituciones privadas a los que se les prescribieron medicamentos respecto a los de instituciones públicas, independientemente del tipo de servicio utilizado, el grupo de edad o la región sociodemográfica. No obstante, se reconoce que la mayor parte de los usuarios que acuden con un médico privado demandan la prescripción de medicamentos, y los médicos generalmente responden a esta presión, ya que de esta manera satisfacen la demanda del cliente y simultáneamente pueden conservar y generar nueva clientela.[9]

Por otra parte, el acceso y el gasto en medicamentos por parte de la población se ha constituido en uno de los elementos principales para evaluar la organización y el funcionamiento de los sistemas de salud.[18,19] Los resultados de este trabajo muestran importantes diferencias en las formas de acceso (con o sin pago directo) y en la magnitud del gasto en medicamentos, relacionadas con las instituciones que brindaron la atención y con las características socioeconómicas de la población estudiada.

La mayoría de los usuarios de las instituciones de seguridad social obtuvieron sus medicamentos sin pago directo debido a que el seguro incluye los medicamentos prescritos por los médicos de estas instituciones. Sin embargo, en el caso de los usuarios de instituciones de asistencia social (SSA y otras instituciones públicas), menos

de la mitad, en promedio, obtuvo los medicamentos sin pago directo. Por lo menos dos interrogantes se plantean al respecto: ¿por qué sólo algunos de los usuarios de las instituciones de asistencia social obtuvieron los medicamentos sin pago directo?, ¿qué medicamentos se obtuvieron sin pago directo y cuáles se compraron?

Dos aspectos, que pueden ser complementarios, contribuyen a responder estas cuestiones. Por una parte, los gobiernos de los estados y las instituciones de salud han implantado normas y criterios sobre el pago de los servicios de salud12 que establecen el acceso a la totalidad de los medicamentos prescritos sin pago, o bien, con el pago parcial o total de éstos. La aplicación de estos criterios varía según estados e instituciones. Hipotéticamente la gratuidad (sin pago directo) se aplicaría en aquellas regiones socioeconómicas consideradas de extrema pobreza, como una política redistributiva y de equidad de los servicios de salud. Por otra parte, el acceso gratuito a determinados medicamentos puede depender de su disponibilidad en los establecimientos, lo cual posiblemente está relacionado con los programas de salud considerados prioritarios. En otras palabras, podría plantearse que la mayoría de los medicamentos disponibles en las unidades de atención corresponde a los programas prioritarios de salud, los cuales tienen establecido que los medicamentos deben proporcionarse gratuitamente a todos los pacientes que así lo requieran. Este es el caso de las sales de rehidratación oral del Programa de Prevención y Control de Enfermedades Diarreicas, los métodos anticonceptivos del Programa de Planificación Familiar y los medicamentos antipalúdicos del Programa de Prevención y Control de Enfermedades Transmisibles por Vector, entre otros; sin embargo, la ENSA-II no obtuvo información que permita analizar la relación entre los tipos de medicamentos obtenidos sin pago directo en las instituciones públicas y los programas prioritarios. Asimismo, uno de cada cinco usuarios de instituciones privadas informó no haber pagado por los medicamentos. Esto se podría deber a que se les proveyó de muestras médicas que corresponden a presentacionesde medicamentos promovidos por los laboratorios farmacéuticos, generalmente con dosis incompletas, a que el costo de los medicamentos fue incluido en el pago de la consulta, o bien, a que el paciente fue atendido en instituciones privadas no lucrativas, entre otras posibilidades. Sin embargo, la encuesta no obtuvo información al respecto para estudiar esta situación.

No obstante, los resultados de la ENSA-II muestran que los grupos de población con malas condiciones socioeconómicas y los de la región socioeconómica con mayor índice de pobreza (PASSPA) fueron los que presentaron la menor proporción de usuarios que obtuvieron los medicamentos sin pago directo. Esto a su vez puede estar relacionado con el hecho de que esta región es la que cuenta con la menor proporción de población asegurada. Incrementar la equidad en el acceso a los medicamentos para los grupos de población con malas condiciones socioeconómicas y, en consecuencia, con menor capacidad de pago representa uno de los mayores retos para el sistema de salud en México. El problema de la equidad en el acceso a los medicamentos debe considerarse como parte de la función redistributiva del sistema de salud,[20] en la cual el fortalecimiento y la racionalización del subsistema de atención a la enfermedad puede jugar un papel importante en la satisfacción de las necesidades de la población.

Respecto a la dimensión económica del gasto en medicamentos en México, es importante considerar que el grupo de usuarios que pagó por los medicamentos prescritos representó, aproximadamente, la mitad del total de los usuarios de los servicios de salud, y que la mediana del gasto directo en medicamentos correspondió a 2.8 salarios mínimos/día (40.00 pesos/12.50 dólares) por evento atendido. De esta manera, si se toma en cuenta que en 1990 los ingresos de 71% de la población económicamente activa correspondían a menos de tres salarios mínimos mensuales,[21] el gasto en medicamentos para determinados grupos de población puede llegar a representar una importante proporción de sus ingresos.

La magnitud del gasto en medicamentos fue mayor para los usuarios de las instituciones privadas. ¿Cuáles son las variables que determinan que los usuarios de instituciones privadas presenten mayor gasto en medicamentos respecto a los de instituciones públicas? Al respecto hay que considerar que un alto porcentaje de usuarios (38%) de estas instituciones adquirieron el medicamento en el lugar de atención. Este hecho puede favorecer que el médico prescriba los medicamentos que le aporten mayores beneficios económicosdirectos, independientemente de los beneficios terapéuticos para el usuario. Sin embargo, también hay que considerar otros aspectos tales como la relación entre el prestigio médico y el tipo de medicamentos que prescribe, ya que determinados sectores de la población y de los médicos consideran que entre más caros, son mejores los medicamentos. Para profundizar en el análisis de este problema, se deben considerar otras variables no incluidas en la ENSA-II, tales como el número y el tipo de medicamentos prescritos; las características técnicas de los prescriptores; la organización de las instituciones donde se encuentran incorporados; el

impacto de la promoción de los laboratorios farmacéuticos en la prescripción de determinados medicamentos, así como la opinión de los médicos y de los pacientes respecto a los medicamentos y a las características de una buena prescripción.

En cuanto a los usuarios de las instituciones de seguridad social que pagaron por los medicamentos prescritos (8%) hubo diferencias según institución; la mayor proporción correspondió a los del Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado y a los de las Secretarías de Defensa y Marina. Esto puede expresar cierta insuficiencia en la disponibilidad de medicamentos en las farmacias de estas instituciones y/o en la falta de ajuste de la prescripción de los médicos al CBM.

Es necesario evaluar el impacto del pago por los medicamentos en la opinión sobre la eficiencia y la calidad de la atención por parte de los usuarios de las instituciones públicas de salud; en este sentido, los de la SSA señalaron la falta de medicamento como uno de los motivos más frecuentes para no volver a demandar sus servicios.[13]

Si bien el análisis de la prescripción, el acceso y el gasto en medicamentos entre usuarios de los servicios de salud representó un segmento importante de la población con algún problema de salud, quedó fuera de este análisis un importante grupo poblacional representadopor los que informaron haber tenido algún problema de salud y se automedicaron. En la ENSA-II, 58.7% de la población que notificó algún problema de salud se automedicó (consumió medicamentos sin prescripción médica);[13] este porcentaje fue similar al informado por otros estudios previos en áreas rurales y urbanas de México.[22,23] En estas condiciones, la automedicación podría considerarse como parte de las respuestas de la población a los problemas de acceso y funcionamiento de los servicios de salud,[24] y un elemento importante para ser analizado en posteriores estudios.

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Mercado farmacéutico en México: tamaño, valor y concentración*

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La industria farmacéutica es uno de los sectores más dinámicos e importantes de la economía mundial en términos de recursos movilizados. Si bien se trata de uno de los sectores económicos en que la globalización es más evidente (los productos se desarrollan para un mercado global), las particularidades de cada país hacen que los mercados nacionales tengan sus propias dinámicas y características.

El mercado farmacéutico mexicano es uno de los de mayor dinamismo en América Latina debido al crecimiento que ha registrado y se ubica como el noveno en importancia en el mundo [1, 2]. Según algunas estimaciones, el sector farmacéutico crecerá en los mercados emergentes, entre los que se incluye México, entre 14% y 15% [3].

Las reformas relacionadas con la provisión de servicios de salud que se llevan a cabo en México -en particular las reformas a la Ley del Instituto Mexicano del Seguro Social y a la Ley de Salud que han dado lugar a la formalización del sistema de protección en salud, el Seguro Popular- han llevado a un notable incremento en el monto de los recursos públicos destinados a la compra de medicamentos. Se espera que, al mismo tiempo, esto permita reducir su compra directa por parte del consumidor final [4].

De acuerdo con la teoría económica, hay algunos bienes cuya demanda es muy sensible al precio, de manera que las variaciones en el precio de venta al público provocan cambios proporcionales en la demanda (bienes elásticos respecto al precio); mientras en otros bienes, las variaciones en el precio ocasionan cambios menos proporcionales -o incluso nulos- en la demanda (bienes inelásticos). Como la capacidad de decisión sobre el consumo es reducida en el caso de los medicamentos, estos se consideran bienes inelásticos respecto al precio.

Mientras menos elasticidad tiene un producto, mayor poder tienen los productores para determinar los precios en detrimento del consumidor. La situación más alejada del ideal es la de un mercado monopólico, en el que la demanda resulta totalmente inelástica con relación al precio. En este caso se hace indispensable establecer regulaciones y estimular la competencia entre varias empresas para evitar precios excesivos. Es preferible un sector más cercano a la competencia perfecta que un mercado concentrado.

El análisis del grado de concentración del mercado -para determinar la proporción que corresponde a cada una de las empresas dentro del mercado- permitirá caracterizar el mercado y conocer su grado de aproximación a un estado de competencia perfecta.

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La caracterización de la segmentación entre el mercado de medicamentos de prescripción o controlado (también llamado ético por la industria) y el de medicamentos que no requieren prescripción o libre (también llamado popular) permite identificar los distintos nichos y estrategias de mercado y de la industria. Se debe tener en cuenta, no obstante, que el comportamiento de esos dos segmentos responde a factores diferentes, ya que las regulaciones pueden tener un efecto mayor sobre el mercado controlado que sobre el libre.

El concepto de elasticidad del precio, dada por la variación porcentual de la demanda de un producto -en este caso farmacéutico- en función de las variaciones porcentuales en el precio, refleja la relación de poder, en términos de determinación de precios, entre los productores y los consumidores [5]. Este indicador refleja la sensibilidad de la demanda ante cambios en el precio: a mayor elasticidad del precio de un producto más se puede afectar la demanda, por lo que los productores deben tener más cuidado al incrementar los precios [5].

El objetivo del presente trabajo es caracterizar el mercado de medicamentos de México en cuanto a su tamaño, organización, poder de mercado de las empresas y capacidad de negociación de los consumidores.

Materiales y métodos

Se realizó un estudio descriptivo a partir de las estadísticas económicas nacionales de carácter público, como los Censos Económicos de 2004 y los informes de Intercontinental Marketing Services, en particular de su rama de salud (IMS Health).

Para describir el mercado mexicano de productos farmacéuticos según su peso relativo en la economía nacional -la contribución porcentual del sector al producto interno bruto- y caracterizarlo según el número y el tamaño de las empresas se analizó el valor total de los productos elaborados en las clases "fabricación de materias primas para la industria farmacéutica" (código 325411 en el Sistema de Clasificación Industrial de América del Norte) y "fabricación de preparaciones farmacéuticas" (código 325412) [6]. Los datos disponibles de los Censos Económicos de 2004 abarcan los establecimientos que brindaron información detallada -ya se dediquen a manufacturar materia prima o producto final-, independientemente de si el destino de su producción es para uso humano o veterinario.

Para hacer un análisis más específico del sector dedicado a productos finales de uso humano, se utilizaron los datos de IMS Health sobre las ventas anuales de las empresas del sector farmacéutico mexicano, tanto en valor como en unidades de medicamentos, en el período de 2002 a 2005. Se tomó en cuenta la segmentación tanto del mercado controlado como del libre. Los datos de las ventas anuales se homogeneizaron mediante el índice de inflación calculado por el Banco de México para el sector farmacéutico, según el valor del peso mexicano en junio de 2006 [7].

Con esta información se calculó el valor total del mercado -como la suma de las ventas de todas las empresas (en pesos mexicanos) en cada segmento-, el porcentaje del mercado que le correspondió a cada empresa por año -como el cociente del valor de las ventas de la empresa sobre el valor total de las ventas- y los porcentajes de los segmentos controlado y libre.

Se calculó el índice de Herfindahl-Hirschman (IHH) para cada año, como medida del grado de concentración del mercado, mediante la siguiente fórmula:

$$IHH = \Sigma(s_i)2$$

donde, *s* es el total de las ventas de la empresa *i* entre el total de las ventas del sector en un año dado. El valor de IHH tiende a cero cuando el número de empresas en el mercado tiende al infinito con una participación similar, y es 1 cuando existe una sola empresa en el mercado [8].

Como una medida complementaria para caracterizar el mercado, se calculó el inverso del IHH, que indica el número de empresas de tamaño similar para un valor dado de IHH y con ello el nivel de competencia existente.

Para estimar la elasticidad del precio, se calculó el precio unitario de un producto índice a partir del cociente del volumen de sus ventas en unidades y el valor de las ventas en pesos mexicanos para cada una de las diferentes empresas (ajustado previamente por la inflación a pesos mexicanos de 2006). Aunque existe una amplia heterogeneidad de productos en el sector farmacéutico (desde antibióticos hasta vitaminas), el análisis basado en un producto índice facilita las comparaciones agregadas sin introducir sesgos que afecten la interpretación de los resultados.

Se calculó la elasticidad del precio (Eqp) entre cada par de años sucesivos entre 2002 y 2005 mediante la siguiente fórmula:

$$Eqp = (\Delta\ \%q/\Delta\ \%p)\ (p/q)$$

donde, p es el precio; q es la cantidad de producto; y Δ % es el cambio porcentual con respecto al año anterior.

Todos los cálculos se llevaron a cabo mediante el paquete estadístico Stata 8.2 (Stata Corporation, Texas, Estados Unidos de América).

Resultados

De acuerdo con los datos de los Censos Económicos de 2004, en México había 480 empresas dedicadas a la producción de materias primas para la industria farmacéutica o de preparaciones farmacéuticas; de ellas, 236 (49,2%) se clasificaron como establecimientos grandes por tener 100 empleados o más.

En conjunto, estas empresas tenían una plantilla laboral de cerca de 62 000 empleados, de los cuales 54 000 (87,1%) trabajaban en las empresas grandes. El tamaño promedio de las pequeñas y medianas empresas (PYMES) fue de 33 empleados, en tanto que el de las grandes fue de 229. En su conjunto, las empresas del sector farmacéutico representaban aproximadamente 0,2% del total de las empresas de manufactura en México y ocupaban a 1,5% del personal empleado en este tipo de industria. De esta forma, la industria farmacéutica mostró una alta intensidad en el uso de recursos humanos (mayor porcentaje de personas que de empresas) y un valor agregado relativamente elevado (mayor porcentaje del valor de los productos que de los recursos humanos empleados).

El valor total de los productos elaborados por el sector fue de 94 mil millones de pesos (115 mil millones en pesos de 2006), de los que 99,0% correspondió a las empresas clasificadas como grandes. Este monto representó 1,2% del producto interno bruto nacional de ese año (20,0% de la participación del sector salud, estimada en 6,0%) y 3,9% del valor de los productos de manufactura. Esto ubicaba a la industria farmacéutica en el tercer lugar en términos del valor de producción, solo por debajo de la refinación de petróleo y la fabricación de productos petroquímicos.

El valor total de las ventas de los productos de uso humano en los años analizados representó 82,8% del monto total de ventas de toda la industria farmacéutica, que en 2003 fue de 112 000 millones de pesos mexicanos de 2006. Para los productos de uso humano, según el tipo de mercados, las ventas de medicamentos controlados en el período estudiado fueron 4,3 veces mayores que las de medicamentos libres, los cuales representaron en promedio 18,8% del total del mercado para esos cuatro años (cuadro 1). Las ventas del sector mostraron crecimientos en todos los años, si bien se observaron grandes variacion que iban de 1,3% entre 2003 y 2004 hasta 6,0% entre 2002 y 2003 (cuadro 1). En total, el mercado creció 11,8% entre 2002 y 2005.

Según los datos de IMS Health para 299 empresas dedicadas a la manufactura y venta de productos farmacéuticos en México (62,3% del total incluido en los Censos Económicos de 2004), 20 empresas concentraron entre 86,0 y 90,3% del mercado mexicano en los años analizados (cuadro 2). De esas empresas, las cinco primeras concentraron 32,1% del mercado en 2005, y a las 10 primeras correspondió 53,4%, lo que confirma que se trata de un mercado altamente concentrado en un grupo reducido de empresas (oligopolio).

Se observaron, no obstante, ligeros cambios en cuanto al poder de mercado en los años analizados: mientras la concentración porcentual del mercado de la mayoría de las empresas que encabezan la lista sufrió reducciones, el poder de las empresas que ocupaban posiciones inferiores se incrementó (cuadro 2).

El valor del IHH se mantuvo relativamente estable durante los cuatro años analizados (alrededor de 0,04), aunque con una reducción sostenida que llegó a 11,6% entre 2002 y 2005, lo que podría indicar que el mercado tiende a una mayor competencia (cuadro 3). Esta tendencia se manifestó también en el inverso del IHH, cuyo valor se incrementó de 23 a 26 entre 2002 y 2005, es decir, aumentó el número de empresas con poder en el mercado.

Cuadro I. Comportamiento del mercado farmacéutico de México entre 2002 y 2005

Tipo de mercado [a]	Ventas totales [b] y cambio porcentual anual (Δ%)						
	2002	2003	Δ% 2003/2002	2004	Δ% 2004/2003	2005	Δ% 2005/2004
Controlado	70 609	75 409	6,8	76 295	1,2	79 770	4,6
Libre	16 868	17 295	2,5	17 620	1,9	18 027	2,3
Total	87 477	92 705	6,0	93 916	1,3	97 797	4,1

[a] Por mercado controlado se entiende la venta de medicamentos de prescripción y por mercado libre las ventas de medicamentos que no requieren prescripción.
[b] Ventas en millones de pesos mexicanos de 2006.

Cuadro 2. Segmento del mercado dominado por las principales empresas del sector farmacéutico de México entre 2002 y 2005

Empresas	Segmento del mercado total (%) y cambio porcentual anual (Δ%)						
	2002	2003	Δ% 2003/2002	2004	Δ% 2004/2003	2005	Δ% 2005/2004
Pfizer	8,6	8,4	-2,3	8,4	0,0	8,0	-4,8
Sanofi-Aventis	8,0	7,7	-3,8	7,5	-2,6	7,5	0,0
Roche	6,9	6,8	-1,4	6,1	-10,3	5,6	-8,2
GlaxoSmithKline	6,2	5,8	-6,5	5,3	-8,6	4,9	-7,5
Schering Plough	6,2	6,4	3,2	6,4	0,0	6,1	-4,7
Novartis	5,5	5,6	1,8	5,4	-3,6	5,1	-5,6
Boehringer Ingelheim	4,6	4,4	-4,3	4,3	-2,3	4,3	0,0
Bayer	4,3	4,3	0,0	4,4	2,3	4,4	0,0
Bristol Myer Squib	4,3	4,2	-2,3	3,6	14,3	3,4	-5,6
Johnson and Johnson	3,9	3,8	-2,6	4,0	5,3	4,1	2,5
Home Products	3,1	2,9	-6,5	2,7	-6,9	2,4	-11,1
Merck Sharp & Dohme	3,1	3,1	0,0	3,0	-3,2	2,7	-10,0
Altana Pharma	2,7	2,7	0,0	2,7	0,0	2,8	3,7
Senosiain	2,5	2,5	0,0	2,7	8,0	2,6	-3,7
Abbott	2,2	2,1	-4,5	2,1	0,0	2,1	0,0
AstraZeneca	2,1	2,4	14,3	2,9	20,8	3,0	3,4
Valeant Pharmaceuticals Int.	2,0	2,0	0,0	2,0	0,0	2,3	15,0
Merck	1,9	2,1	10,5	2,5	19,0	2,7	8,0
Lilly	1,8	1,8	0,0	1,9	5,6	2,2	15,8
Sanfer	1,8	1,8	0,0	1,8	0,0	1,8	0,0
Otras	18,3	19,2	4,9	20,3	5,7	22,0	8,4

Cuadro 3. Índice de Herfindahl-Hirschman (IHH), su inverso y elasticidad del precio en el mercado farmacéutico de México entre 2002-2005

Año	IHH	Inverso de IHH[a]	Elasticidad del precio
2002	0,043	23	NA
2003	0,042	24	0,007
2004	0,040	25	0,003
2005	0,038	26	-0,002

[a] El universo del IHH indica el número de empresas que se esperan en el mercado para un valor dado de IHH.

Finalmente, la elasticidad del precio de los productos farmacéuticos fue mínima a lo largo del período (cuadro 3). Aunque se observó una tendencia a aumentar, los valores de este indicador se mantuvieron cercanos a cero, reflejo de una completa falta de elasticidad.

Discusión

El mercado farmacéutico mexicano es un oligopolio en el que en 2005 un grupo reducido de 5 a 10 empresas controlaban entre 32,1% y 53,4% de un mercado inelástico en términos de precios. Es decir, como se ha mencionado en otros estudios, se trata de un mercado concentrado en el que los productores cuentan con un mayor poder relativo para fijar los precios que los consumidores [9].

De acuerdo con estudios previos, la concentración del mercado farmacéutico mexicano mostró una tendencia a una mayor concentración, si bien con algunas modificaciones en las empresas dominantes. Un estudio de 1996 encontró que en ese momento 10 empresas concentraban 33,0% del mercado [10].

Por su volumen de venta, el sector farmacéutico ocupa el segundo lugar en la economía manufacturera nacional, sólo por debajo de la industria petrolera. De acuerdo con los datos presentados, este sector ha incrementado sus ventas en 11,8% entre 2002 y 2005. Este crecimiento es mayor en 18,0% que el de la economía nacional (el producto interno bruto en ese mismo período aumentó 10,0%) (7) y ratifica su ubicación como uno de los sectores más dinámicos de la economía mexicana.

Una particularidad del mercado farmacéutico mexicano es la clara diferenciación entre los sectores privado y público: si bien un porcentaje importante de las ventas se realiza directamente a los consumidores finales, los laboratorios que operan en México destinan esfuerzos considerables para constituirse en proveedores del sector público por el volumen que se puede negociar en un solo contrato. Esta estrategia, no obstante, es particularmente importante para los laboratorios nacionales [11].

En cuanto a su participación en el gasto total en salud, de acuerdo con las cifras del Sistema de Cuentas en Salud de la Secretaría de Salud de México, las ventas de productos farmacéuticos representaron 17,7% y 18,3% del total en los años 2002 y 2003, respectivamente [12].

La tendencia a mantener e incrementar el poder de mercado, concentrado en un grupo reducido de empresas, representa sin dudas un reto para su regulación, ya que esto crea incentivos para que esas empresas coludan y obtengan condiciones ventajosas para sus actividades comerciales.

Los posibles cambios en los patrones de compra -más concretamente en los porcentajes cubiertos por el sector público y los consumidores individuales- podrían modificar la estructura del mercado farmacéutico mexicano. Es importante contar con un panorama claro de la estructura del mercado y los grados de concentración existentes para analizar esos cambios y sus posibles consecuencias.

El marco regulatorio actual -que busca prevenir incrementos excesivos de los precios mediante límites vinculados con las variables macroeconómicas- no se ha respetado del todo, lo que ha dado lugar a propuestas que buscan relacionar los precios iniciales de los productos con los del mercado internacional, así como establecer ajustes asociados con la inflación [13]. En otros países, las políticas de regulación de precios a partir de incentivos a la competencia con genéricos han mostrado resultados positivos [14]. No obstante, esas políticas regulatorias podrían estar enfocándose demasiado en los aspectos industriales de la regulación y se estaría descuidando el papel fundamental de este mercado en la salud de la población [15].

En México, el poder relativo de los productores está generando precios socialmente ineficientes, que generan una demanda no óptima de los productos farmacéuticos. Al tratarse de bienes relacionados con la salud, esto podría estar teniendo consecuencias negativas en la salud de la población y el bienestar social. Se debe recordar que los precios elevados pueden ocasionar que los medicamentos no sean accesibles, especialmente para la población sin seguro de salud que debe pagarlos directamente de su bolsillo.

Aunque en México podría esperarse que las reformas orientadas a aumentar el porcentaje de las compras de medicamentos que se realizan a través de agencias como el Seguro Popular (un seguro de salud con contribución gubernamental y subsidios según el ingreso de la familia), se debería modificar la correlación de fuerzas en la fijación de los precios, ya que existen condiciones que podrían generar el efecto contrario. Por ejemplo, la descentralización del sector de la salud mexicano -es decir, el traslado a los estados de los recursos y la capacidad de decisión- ha propiciado que los gobiernos estatales negocien la compra de medicamentos de manera independiente, lo que reduce el poder que generaría hacer una compra consolidada nacional.

En un contexto en el que las principales necesidades de salud se concentran en la población de menores recursos, el acceso oportuno a los medicamentos básicos se convierte en una prioridad política. Los medicamentos son útiles únicamente si se encuentran al alcance de los que los necesitan; este es un elemento esencial que debe tomar en cuenta el marco regulatorio del mercado farmacéutico [16].

Desde el punto de vista de las herramientas de que disponen los ministerios de salud, un mecanismo factible para modificar la correlación de fuerzas son las negociaciones consolidadas para la compra de medicamentos, si bien esta estrategia podría ser funcional únicamente para el mercado controlado, en el que se concentran los medicamentos prescritos por los servicios públicos. Un ejemplo del poder de mercado que puede ejercer un monopsonio (una entidad que concentra todas las compras de un producto) son las compras consolidadas del Instituto Mexicano del Seguro Social. Esta experiencia puede expandirse para concentrar las negociaciones de compra de medicamentos con recursos públicos, de forma tal que sea posible negociar precios consistentes y mejores, acorde con la capacidad de pago del país. En teoría, las compras consolidadas podrían hacerse entre varios países para grupos de medicamentos, como se ha hecho ya para los antirretrovirales [17].

Por otra parte, una mayor competencia podría ser beneficiosa para los consumidores, como se ha observado en otros países. Sin embargo, no está claro hasta qué punto es factible la entrada de nuevas empresas en el mercado mexicano, especialmente si se toma en cuenta la importancia y el elevado costo de la investigación y el desarrollo en este sector [18]. Esto hace que participen solo grandes empresas nacionales y extranjeras con capacidad de invertir en nuevas tecnologías y aplicaciones.

Se deben tomar en cuenta las experiencias de otros países de ingresos medios en la producción de medicamentos genéricos, especialmente cuando las condiciones de salud demandan una cantidad masiva de recursos. Es necesario considerar los elementos a favor y en contra, ya que algunas soluciones podrían reducir los incentivos a la investigación y el desarrollo en salud, en particular los relacionados con problemas específicos de los países en desarrollo [19, 20].

Los datos presentados en este análisis tienen algunas limitaciones. La más importante es que los cálculos de elasticidad se hicieron a partir de un producto índice y no de cada producto individual de la industria farmacéutica. Si bien esto limita el detalle del análisis, no hay razones para argumentar que esto modifica el resultado central del análisis.

Este trabajo constituye una primera caracterización del mercado farmacéutico mexicano, uno de los sectores más dinámicos de la economía nacional. Se comprobó que se trata de un mercado oligopólico e inelástico, por lo que se justifica la creación de mecanismos regulatorios más sólidos que reduzcan el poder de los productores en favor de los consumidores. Entender el funcionamiento del mercado farmacéutico es un primer paso para desarrollar estrategias que incentiven su eficiencia en términos de su rendimiento social.

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Factors influencing global antiretroviral procurement prices*

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Why do antiretroviral medicines (ARV) prices matter?

Since the mid 1990s, highly active antiretroviral treatment (HAART) has become the standard recommended treatment, including a combination of at least three antiretroviral medicines. Between 2002 and late 2007, the number of patients receiving antiretroviral treatment (ART) worldwide grew from around 300,000 to approximately 3 million people [1].

However, there remains a large gap between those in need of receiving HAART and those who receive it. According to estimates, out of the 33.5 million people living with HIV/AIDS, 10 million need HAART, which leaves 7 million people living with HIV and AIDS (PLWHA) currently untreated. This is particularly problematic in Sub-Saharan Africa, where two-thirds of all PLWHAs are residing[2]. Furthermore, it is estimated that 13.7 million people in 2010 and 21.9 million people in 2015 will need ART [2].

Affordability remains a critical issue, despite the fact that between 2000 and 2007, the median price for first-line combination therapy in developing countries fell from US$10,000 to about US$90 per patient per year [3]. But even US$90 remains unaffordable for many low-income countries to spend on care for PLWHA, even when considering the growing availability of donor funds. In addition, an increasing number of PLWHA require second-line treatment because of resistance to first-line drug treatment or an inability to tolerate first-line drugs. As a result, many low- and middle-income countries are struggling to provide sustainable access to HAART.

In 2007, the WHO reported that the median price for the most frequently used second-line HAART (abacavir + didanosine + lopinavir/ritonavir) for low-income countries was US$1,214, 13.5 times higher than for first-line treatment. In middle-income countries, the price for second line therapy was 36.3 times higher than for first line therapy (US$3,306 for second-line therapy, as compared to US$91 for first-line therapy) [4]. Similarly, Médecins sans Frontières (MSF) reported that, according to manufacturer price information, a change from the cheapest first-line regime quoted with US$87 to the cheapest second line with $US749 (tenofovir + emtricitabine + lopinavir/ritonavir) will at least increase expenditure nine-fold [3]. As PLWHA on HAART live longer, an increasing number will require second- and third-line therapies. The durability of first-line therapy greatly var-

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ies between regions; overall, it has been estimated that 22% of patients switch after a mean time of 20 months to a second-line combination [5]. An analysis of factors influencing ARV prices is very relevant to increase long-term efficiency (best value for money) in the provision of HAART. This would allow designing appropriate policies to fuel the production of low price ARVs or to implement the most effective procurement processes.

One world, one price?

A first hypothesis that could be tested is that antiretroviral prices do not differ significantly across countries. In fact, some pharmaceutical companies, such as Pfizer, have introduced new medications (e.g. maraviroc) at one global price, without any tiered pricing or discounts provided to poorer or countries with higher prevalence [3]. Such an approach has numerous advantages, including eliminating the risk for arbitrage (purchasing medications in a low price country and reselling them in a higher priced country) [6] and limiting objections from some countries about why they are paying more than others. It may also be argued that having one global price is more equitable since every country pays the same price (although alternatively it may be argued that such a pricing policy is inequitable because it does not recognize the lower ability of poorer countries to pay).

The pricing data on ARVs, however, overwhelmingly disproves the hypothesis that prices do not vary from country to country. For example, the average price per patient per year paid for by lower income countries for lopinavir/ritonavir 133/33 mg is US$500, whereas the price for the same product in middle-income countries is US$1134 [4]. Pharmaceutical companies have tried, in some cases, to rationalize these price differences by establishing tiered pricing based on socioeconomic status and/or other factors (Merck, 2008) [7]. Even with these attempts, however, countries have nevertheless been able to negotiate significant discounts on ARVs which are not available to other neighboring countries [3].

Other than the socioeconomic status of a country, the factors potentially responsible for the observed differences in prices are numerous, including the prevalence of HIV, the volume, the role of third party negotiators such as the Clinton HIV/AIDS Initiative[8] or the United States President's Emergency Plan For AIDS Relief (PEPFAR) [9], and access to generics. Vasan et al [10] found that differential prices are inconsistently applied, particularly among lower middle-income countries which are charged higher prices. Similarly to Vasan et al [10], Chien [11] used the Global Price Reporting Mechanism (GPRM) database to analyze both volume and ARV prices in sub-Saharan Africa, concluding that, despite differential pricing, generic drugs were still being purchased at significantly lower prices than innovator products.

The objectives of the present study were twofold: first, to analyze global ARV prices between 2005 and 2008 and associated factors, particularly procurement methods and key donor policies on ARV procurement efficiency; and, second, to discuss the options of procurement processes and policies that should be considered when implementing or reforming access to ARV programs. Given the limited analysis of the impact of procurement methods and policies on procurement prices, the present study could provide important policy recommendations for individual countries and also for donor organizations. Should all countries or HIV/AIDS programs be recommended to use a third party negotiation strategy to achieve lower prices? Should countries or HIV and AIDS programs always choose generic ARV over innovator products if patent policies allow doing so? Does bulk procurement result in lower prices?

Methods and data sources

In order to analyze factors influencing global ARV prices, the Global Price Reporting Mechanism (GPRM) was analyzed. While other sources use price quotes from manufacturers [3], the strength of the GPRM is that it provides information on the ARV prices that countries actually paid (note: not end users of the drugs). The majority of the information is transactional data for ARV procurements made with donor funds from the Global Fund for AIDS, Tuberculosis and Malaria (GFATM). Other data come from the country offices that report procurement prices to the World Health Organization (WHO), as well as international organization and procurement agencies, such as Mission Pharm, United Nations Children's Fund (UNICEF), International Dispensary Association Foundation (IDA). These prices are all posted by the WHO on their publicly accessible databasehttp://www.who.int/hiv/amds/price/hdd/ *webcite*. For this study, information was downloaded in March 2009. We used procurement data from January 2005 to December 2008, reported for twelve of the most frequently used adult ARV medicines in first-line and second-line therapy regimes in developing countries: efavirenz 600 mg, lamivudine 150 mg, lamivudine 150

mg/zidovudine 300 mg, nevirapine 200 mg, stadivudine 40 mg and zidovudine 300 mg as first-line therapy; and abacavir 300 mg, didanosine 100 mg and 400 mg, lopinavir/ritonavir 133/33 mg, ritonavir 100 mg and tenofovir 300 mg as second-line therapy. (We used the WHO classification of first- and second-line therapy [4]).

A total of 11,276 transactions were available for an analysis the 12 chosen ARVs (minimum of 332 transactions for ritonavir to 1,732 for nevirapine) (Additional file 1, Table 1). In total, 92 countries reported data to the GPRM, 48 of them classified as low-income countries, the rest lower-middle, upper-middle and very few high-income countries. Out of all transactions, 84.6% were made by countries which participated in the Clinton HIV/AIDS Initiative (CHAI) in 2008 and 40% of purchases were made by PEPFAR focus countries. All prices in the present study are reported in US dollars, unadjusted for inflation. This is to allow comparison with other international literature on drug prices that also use prices unadjusted for inflation [3,4]. In some cases, very high prices were corrected when it was obvious that this was due to a recording error; for instance, when instead of unit price the package price was reported (a multiplication of the number of units per package by unit price). Also donations were eliminated (purchases reported with a price of US$0).

First, for each of the ARV and year of study, the median price per patient per year was calculated. Since prices were not normally distributed, the prices at the 25th and 75th percentiles of the sample are also reported.

In order to identify the principal factors influencing prices of each ARV, linear regression models were used choosing the following independent variables based on their theoretical importance on price: HIV country prevalence (<2%, 2-5%, >5%) [1], volume (in terciles), national income per capita using the World Bank classification (low-income, lower-middle-income, upper-middle-income)[12], AIDS Program Effort Index (API) [13], whether the product procured was innovator or generic product (determined by the database entry of the manufacturer which sold the ARV), whether the country is member of CHAI and whether the country is one of the 15 focus countries for the United States President's Emergency Plan For AIDS Relief (PEPFAR) [14]. (PEPFAR operates in 114 different countries, but only 15 countries are identifies as "focus countries".) High-income countries were excluded from the regression models since it is likely that the factors influencing prices in those countries are different than in other income groups. In addition, the number of procurements reported was very small.

Prices were transformed in the logarithm as they were not normally distributed and clustered by year (for instance, all purchases of tenofovir were clustered by the year in which they were purchased). To benchmark prices for each ARV separately, the lowest direct manufactured cost per patient per year (LDMC) and highest direct manufactured cost per patient per year (HDMC) for 2007 was obtained. The information on the LDMC and the HDMC was obtained from Pinheiro et al [15] using the lowest and highest active pharmaceutical ingredient (API) prices reported by the WHO and the direct and indirect production costs from Brazil's public production facilities. To identify the characteristics of those countries that purchased ARVs in 2007 at the LDMC and HDMC per patient per year, two logarithmic regression models were used: one model where the dependent variable was a procurement price higher than the LDMC per patient per year and the other model where the dependent variable was a procurement price higher than the HDMC per patient per year. Independent variables were the same as used in the linear models above. ARVs were clustered by year and by type.

Results

The majority of procurement price entries into the GPRM database are made by low-income countries. Exceptions are procurement reports of lopinavir/ritonavir and ritonavir where less than 40% of the reporting countries are low-income (Additional file 1, Tables 1 and 2).

For each ARV, countries were mainly purchasing generic products for first-line ARVs. For second-line ARVs, this was only between 8 and 66% of purchases. For first-line ARV, prices dropped between 81% and 123% in the last four years, with the exception of zidovudine (-40%) and stadivudine (0%) (Additional file 1, Table 1). Price reductions for second-line ARVs was considerably smaller, between 0% and 61%, with the exception of abacavir, which dropped by 165%. Didanosine 400 mg and ritonavir 100 mg prices were constant during the study period.

Variables associated with price

The results of the regression model show that, generally speaking, the strongest predictor of price is whether the ARV is purchased as innovator or generic (Tables 1 and 2).

Except lopinavir/ritonavir, the innovator is more expensive than the generic product, despite price reductions

Table 1. Factors associated with first-line ARV prices

Antiretroviral drugs+	EFV 600 mg	3TC150 mg/ZDV 300 mg	3TC 150 mg	NVP 200 mg	d4T 40 mg	ZDC 300 mg
HIV prevalence 2-5%	-0.079 (-0.247, 0.089)	0.056 (-0.123, 0.236)	0.081 (-0.166, 0.328)	0.126 (-0.003, 0.256)	0.156 (-0.346, 0.035)	-0.014 (-0.179, 0.152)
HIV prevalence >5%	-0.120 (-0.301, 0.061)	0.140 (-0.026, 0.307)	0.143 (-0.211, 0.497)	0.100* (0.006, 0.194)	0.230 (-0.686, 0.226)	-0.008 (-0.056, 0.041)
Lower-middle income	0.035 (-0.088, 0.158)	0.114 (-0.088, 0.316)	0.053 (-0.242, 0.348)	0.200 (-0.208, 0.609)	0.356 (-0.277, 0.989)	0.027 (-0.212, 0.266)
Upper-middle income	0.027 (-0.180, 0.233)	0.356** (0.295, 0.416)	0.308* (0.160, 0.456)	0.390** (-0.295, 0.485)	0.483* (0.146, 0.820)	0.190* (0.018, 0.363)
Volume 2ndtercile	-0.039 (-0.264, 0.186)	-0.040 (-0.144, 0.063)	-0.041 (0.217, 0.134)	-0.149* (-0.296, -0.002)	0.120 (-0.280, 0.039)	-0.033 (-0.152 -0.085)
Volume 3thtercile	-0.136 (-0.407, 0.135)	-0.034 (-0.196, 0.128)	-0.045 (-0.271, 0.181)	-0.271* (-0.523, -0.020)	-0.143 (0.400, 0.113)	-0.073 (-0.226, 0.079)
API***	-0.002 (-0.015, 0.012)	-0.007* (-0.015, 0.000)	-0.013** (-0.019, -0.006)	-0.003 (-0.007, 0.001)	-0.001 (-0.013, 0.011)	0.001 (-0.011, 0.013)
Innovator	0.568** (0.299, 0.837)	0.736** (0.409, 1.063)	0.452* (-0.094, 0.810)	1.730** (1.366, 2.093)	1.000* (0.372, 1.629)	0.458** (0.210, 0.705)
CHAI++	-0.104 (-0.538, 0.331)	-0.156 (-0.356, 0.042)	-0.264* (-0.511, -0.017)	-0.105 (-0.368, 0.159)	-0.190 (-0.761, 0.382)	0.015 (-0.335, 0.365)
PEPFAR+++	0.007 (-0.228, 0.242)	-0.089* (-0.194, -0.015)	-0.132 (-0.491, 0.228)	-0.048 (-0.374, 0.278)	0.015 (-0.325, 0.354)	-0.069 (-0.227, 0.089)
R-square	0.338	0.390	0.305	0.560	0.396	0.183
Observations	1514	1519	1244	1638	619	771

Linear regression models whether the dependent variable is the logarithm of price. The reference categories are: HIV Prevalence <2%; Low income countries; Volume 1st tercile
* significant at 5%; ** significant at 1%; Robust 95% confidence intervals in parentheses ***API = AIDS Program Effort Index; +Abbreviation of the ARV drugs: EFV = efavirenz; ZDV = zidovudine; 3TC = lamivudine; NVP = nevirapine; d4T = stadivudine; ++CHAI = Clinton Foundation HIV/AIDS initiative; +++PEPFAR = President's Emergency Plan for AIDS Relief.
Data source: Global Price Reporting Mechanism 2005 to 2008

for many originator ARVs. Another relevant predictor of price of first-line ARV was a country's socioeconomic status; for lamivudine, lamivudine/zidovudine, nevirapine, stadivudine and zidovudine, upper-middle-income countries were paying statistically significant higher prices. Regarding HIV prevalence, for three second-line ARVs, the higher the countries' HIV prevalence, the lower the price. For other second-line and first-line ARVs, prevalence was not significantly associated, except nevirapine, for which countries with higher prevalence paid more.

Contrary to the commonly held assumption that countries procuring large volumes have lower prices, the data of the GPRM do not support this. Only in two out of 12 regression models, was larger volume associated with lower price (nevirapine and lopinavir/ritonavir).

Whether the country is a member of CHAI was statistically significantly associated with lower prices for three second-line drugs (abacavir, didanosine 400 mg, ritonavir) and one first-line ARV (lamivudine). In regards to the importance of being a PEPFAR priority country, the data indicate that PEPFAR priority countries were in the majority of cases not associated with the ARV price; only in the cases of didanosine 400 mg and lopinavir/ritonavir PEPFAR focus countries were paying more and the case of lamivudine/zidovudine they were paying less. Although statistically significant for two first-line ARVs, the API was not strongly influencing prices.

Characteristics of countries paying more than minimal and maximum marginal costs for ARVs

Paying more than the LDMC and HDMC per patient per year was very strongly associated with innovator product (Table 3). Countries defined as "lower-middle-income" and "upper-middle-income" were identified as paying significantly more for ARVs than "low-income countries". Paying less than the HDMC per patient per year was

Table 2. Factors associated with second-line ARV prices

Antiretroviral drugs+	ABC 300 mg	ddI 100 mg	ddI 400 mg	LPV/r 133/33 mg	RTV 100 mg	TDV 300 mg
HIV Prevalence 2-5%	-0.060 (-0.181, 0.061)	-0.109 (-0.298, 0.080)	-0.509** (-0.663, -0.354)	-0.405* (-0.785, -0.024)	-0.107 (-0.453, -0.239)	-0.126* (-0.222, -0.031)
HIV Prevalence >5%	-0.092 (-0.247, 0.063)	-0.167 (-0.335, -0.002)	-0.343** (-0.417, -0.269)	-0.629* (-1.015, -0.244)	-0.382 (-1.041, 0.277)	-0.137* (-0.265, 0.010)
Lower-middle-income	-0.018 (-0.155, 0.118)	0.227 (-0.417, 0.871)	0.573 (0.199, 0.948)	0.657 (0.033, 1.282)*	-0.050 (-0.328, 0.428)	0.165 (-0.006, 0.337)
Upper-middle-income	-0.040 (-0.278, 0.198)	0.407 (0.129, 0.684)*	0.369 (0.063, 0.676)*	0.284 (-0.373, 0.942)	-0.049 (-0.313, 0.410)	0.272* (0.076, 0.467)
Volume 2nd tercile	-0.006 (-0.123, 0.111)	0.010 (-0.165, 0.185)	0.146 (-0.096, 0.388)	-0.039 (-0.336, 0.257)	0.017 (0.536, 0.501)	-0.117 (-0.256, 0.022)
Volume 3th tercile	-0.003 (-0.109, 0.103)	0.023 (-0.190, 0.235)	0.118 (-0.273, 0.509)	-0.410* (-0.637, -0.182)	-0.405* (-0.785, -0.025)	-0.158 (-0.329, 0.012)
API***	-0.004 (-0.007, 0.002)	0.008 (-0.011, 0.026)	-0.012 (-0.027, -0.004)	-0.006 (-0.018, 0.006)	0.007 (-0.013, 0.027)	0.001 (0.002, 0.004)
Innovator	0.662** (0.451, 0.873)	0.571** (0.411, 0.730)	0.148* (0.051, 0.245)	-0.714** (-0.989, -0.438)	-0.793 (-1.789, 0.204)	0.274** (-0.138, 0.410)
CHAI++	-0.143* (-0.274, -0.012)	-0.499 (-1.099, 0.102)	-0.550* (-0.982, -0.117)	-0.279* (-0.499, 0.060)	-0.666** (-1.098, -0.235)	-0.193 (-0.582, 0.197)
PEPFAR+++	0.054 (-0.049, 0.157)	0.046 (-0.265, 0.358)	0.347 (0.092, 0.785)	0.486* (0.091, 0.880)	-0.118* (-0.233, 0.002)	0.084 (-0.040, 0.209)
R-square	0.578	0.455	0.481	0.269	0.221	0.408
Observations	793	492	397	484	309	489

Linear regression models whether the dependent variable is the logarithm of price. The reference categories are: HIV Prevalence <2%; Low income countries; Volume 1st tercile
* significant at 5%; ** significant at 1%; Robust 95% confidence intervals in parentheses; ***API = AIDS Program Index; +Abbreviation of the ARV drugs: ABC = abacavir; ddI = didanosine; LPV/r = lopinavir/ritonavir; RTV = ritonavir; TDV = tenofovir; ++CHAI = Clinton Foundation HIV/AIDS initiative; +++PEPFAR = President's Emergency Plan for AIDS Relief
Data source: Global Price Reporting Mechanism 2005 to 2008

associated with being member of CHAI and paying less than the LDMC per patient per year was associated with procuring very high volumes. No association was found between being a PEPFAR focus country.

Discussion

The results of the present study, together with findings from the literature, help to identify factors that influence prices and to make some recommendations of how procurement processes and policies could contribute to achieve better value for money.

Generic products are very important to bring prices down

In our models, whether a country purchases an innovator product or a generic product is the strongest predictor of price. Generic prices were found to be generally lower than innovator prices, which means that, despite tiered pricing patented medications, prices have not yet caught up with the lower prices offered by generic manufacturers. As there are exceptions, a recommendation to always rely on generic products would not be beneficial. For example, the innovator product of lopinavir/ritonavir was associated with lower prices than the generic products. Countries that, due to patent law, are obligated to procure innovator products, are in a very difficult position because they have no option other than to negotiate with a monopoly provider for lower prices. Finding mechanisms to increase the negotiating power of the purchasing country may help. However, it is important to note that not all approaches to strengthen the bargaining position of purchasers have been successful. For example, data from the Andean region suggests that negotiating as a block of countries does not necessarily result in lower prices for individual countries [16].

Table 3. Factors influencing purchases higher than the lowest and the highest direct manufactured costs

	More than lowest direct manufactured costs				More than highest direct manufactured costs			
	Odds ratio	p-value	Lower 95%CI	Upper 95%CI	Odds ratio	p-value	Lower 95% CI	Upper 95% CI
HIV prevelence < 2%	1				1			
HIV Prevelence 2-5%	0.75	0.174	0.50	1.13	1.17	0.389	0.81	1.70
HIV Prevalence >5%	0.86	0.300	0.65	1.14	1.36	0.103	0.94	1.97
Low income	1				1			
Lower-middle income	1.43	0.079	0.96	2.14	1.63	0.010	1.13	2.37
Upper-middle income	4.05	0.000	2.23	7.34	2.02	0.003	1.27	3.23
PI*	0.99	0.311	0.98	1.00	0.99	0.480	0.98	1.00
Volume 1sttercile	1				1			
Volume 2ndtercile	0.76	0.211	0.50	1.17	1.28	0.060	0.99	1.65
Volume 3thtercile	0.56	0.016	0.35	0.90	0.69	0.055	0.48	1.01
Innovator	4.01	0.003	1.60	10.45	6.10	0.000	3.09	12.05
CHAI**	0.77	0.255	0.49	1.20	0.53	0.001	0.36	0.77
PEPFAR***	0.88	0.482	0.61	1.26	1.27	0.143	0.92	1.75
Pseudo R2	0.0994				0.1752			
Number of obs	9161				9161			

*API = AIDS Program Effort Index; **CHAI = Clinton Foundation HIV/AIDS Initiative; ***PEPFAR = President's Emergency Plan for AIDS Relief.
Data source: Global Price Reporting Mechanism 2005 to 2008

Country income-level

Country income-level had an important impact on the ability of a country to obtain prices lower than the LDMC or HDMC. Only in exceptional cases did countries with a higher income pay lower prices. This result is consistent with the expected result in a non-competitive market, where the manufacturers are able to sell at a price level that corresponds with the country's willingness and ability to pay. In this context, it seems important to mention that many lower- and upper-middle-income countries pay a significant proportion or all costs for ARVs compared to low-income countries often relying on donor funds.

Procurement methods

One procurement method to influence prices is bulk procurement. Contrary to the common assumption that large volume procurement by countries results in lower prices, the results of the present study indicate that volume is in very few cases associated with lower prices which is in line with recent findings from other authors [17]. However, we found that procurement of very high volume was associated with obtaining less than the LDMC per patient per year. Some authors have found that small volumes are sometimes used to introduce a product to the country at a special low price [10]. Interestingly, on the one hand, volume gives countries more power to negotiate; on the other hand, the higher volume means that there are more people who will demand treatment and the countries are facing political pressure to respond to this need, which could reduce their negotiation power.

Another procurement method to lower prices in theory is third-party negotiation, which is used by CHAI. In our analysis, CHAI was associated with paying less than the HDMC. However, when analyzing each ARV separately, being a member of CHAI was only associated with a lower price for some ARVs. More analysis is needed to determine which countries would benefit from being a member of CHAI and how the strategies used by CHAI could be optimized to achieve further price reductions.

Donor policies

In terms of the effect of large donors on ARV prices, being a PEPFAR focus country did not result in a lower price for all except one of the ARVs studied. It has been argued that higher prices for PEPAR countries do not necessarily mean less value for money[18]. In this study, quality was not taken into account. The ARVs that are procured by PEPFAR need to be registered with the FDA, which means that the program may choose a higher priced product over a lower-priced one, in a case in which the latter does not have a tentative approval process with the FDA [14,18]. However, in its 2008 program report, it is stated that 70% of the products from the supply chain management support of PEPFAR have the lowest international listed price (Office of the United States Global AIDS Coordinator, 2008). Interestingly, the report mentions two obstacles that make it difficult to increase the use of generics despite the objective of PEPFAR to do so: (a) the slow approval process of generics in some countries and (b) the quality concern of some buyers. It is worthwhile to investigate how many countries these barriers apply to and potential strategies to overcome them.

Another donor policy worth discussing here is the Global Fund and CHAI requirements for countries to report their pricing data. In the past decade, medicine procurement prices have been an area "that has been plagued by a troubling lack of transparency"[19]. However, this requirement of price reporting has resulted in an unprecedented accumulation of procurement price information at the global level. There has been some controversy whether increasing the transparency of prices would result in lower prices for countries. The key argument against it is that it would undermine the prices charged in higher-income countries, since the higher-income countries would demand the prices of low-income countries [6,20]. Even though it is not possible to determine how ARVs would have developed without the GPRM, the creation of the global database and the unprecedented global effort to increase price transparency nevertheless provides an important tool for more efficient procurement thorough benchmarking.

However, there is room for improvement: first, the GPRM data base is more comprehensive for low- and lower-middle-income than upper-middle-income and high-income countries, resulting in a lack of publicly available, systematically gathered information about prices for these latter countries. Particularly, upper-middle-income countries are in a double disadvantage: 1) limited price information on a global level and 2) many manufacturers do not include upper-middle-income countries in their tiered pricing system. As a result, upper-middle-income countries must negotiate individually, thus in some cases limiting their country's ability to achieve lower prices.

Second, more analysis is required on how the data is currently used by staff involved in procurement decisions and how it can be optimized to support procurement efficiency.

Limitations

The GPRM data mainly include donor-funded procurement transactions from low-income and lower-middle-income countries, so it may not be representative of the total procurement of ARVs worldwide and results may not be generalized to all countries. Although staff of donor organizations sending the transaction data and those receiving them at WHO routinely review the reported information for entry mistakes, we checked all entries before analysis according to the procedure described above. However, we did not interview country procurement offices to verify the information reported to the donor organizations, which means that it was not possible to correct all potential errors. Taxes, tariffs and international commercial terms (INCOTERMS) are not consistently reported, so we did not include them in the analysis. Based on the US Government Accounting Office (GAO) and Management Sciences for Health (MSH), the WHO has reported that taxes, tariffs and INCOTERMS are between 3% and 15% [4]. Due to these weaknesses of the data, our results need to be interpreted in the light of the limitations of the database. As improved procurement data will be available in the near future, more analysis needs to be done to confirm our results.

This analysis did not consider pediatric formulations, only adult formulations. Other authors have analyzed the need to scale up production and increase distribution of ARV formulations that are suitable for children [21]. It is important to mention that some of the factors in our regression models are confounding; for instance, PEPFAR focus countries are mainly low-income countries. Our models do not explain most of the observed variance in the data. This suggests that a substantial part of the variation is due to factors which are not included, indicating that price determinants may be much more complex than our model suggests.

Other factors much more difficult to measure, such as corruption or the countries' willingness and capacity to

negotiate with monopoly providers, could explain some differences. We used the API to account for some of these country-specific characteristics.

Recommendations

The results presented allow identifying options of procurement processes and policies that should be considered when implementing or reforming access to ARV programs:

1. Using existing pricing data for benchmarking to improve procurement efficiency.
2. Moving away from only relying on larger volume to lower prices. It has been shown that bulk procurement alone is insufficient to lower prices.
3. Conducting more empirical analysis to identify strategies which optimize third party negotiation, particularly for CHAI.
4. PEPFAR focus countries do not have an advantage or a disadvantage over other countries to obtain lower prices. More research should focus on how to overcome quality concerns of buyers and slow registration processes of generic ARVs in affected countries as identified by PEPFAR as one of the main obstacles for the use of generics.
5. Identifying which other procurement methods result in more value for money in the future; for instance, whether strengthening negotiation skills for countries would result in lower prices.

Authors' contributions

All authors were involved in the outline of the paper. VW analyzed the data and wrote the first and all following drafts of the manuscript. SF, AVM, SBA and substantially revised the drafts and re-wrote parts of the manuscript.

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Trends in antibiotic utilization in eight Latin American countries, 1997-2007*

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Resistance to antibiotics is an important public health problem as it leads to treatment failures (with incumbent morbidity and mortality) and the increased empirical use of more costly broad-spectrum antibiotics. Over the last two decades, it has been clearly established that high levels of community antibiotic consumption correlate with high levels of community resistance to antibiotics[1±3]. Consequently, learning about the patterns of community antibiotic consumption is fundamental in order to design regional and local interventions directed at optimizing the use of these important medicines.

In Europe, the European Surveillance on Antibiotic Consumption (ESAC), among other initiatives funded by the European Union, is creating evidence to inform public health policies on use and surveillance of consumption[3]. It has triggered an unprecedented wave of antibiotic consumption data all over Europe[4±6], national campaigns to improve antibiotic use[7], and many research studies to extend surveillance and other interventions to improve antibiotic use[8]. In many other parts of the world, particularly developing countries, measuring consumption of antibiotics presents a major challenge; it traditionally has received little attention and, consequently, modest funding[9]. Information systems are scarce and unreliable; local studies are time and resource intensive, and extrapolating consumption from the local to the national level has major limitations[10].

In Latin America, the Pan American Conference on Antimicrobial Resistance held in 1998 concluded that among the main priorities for the region were measuring and reporting antibiotic consumption[11]. Although notable advances have occurred in regional surveillance of resistance[12], the patterns and severity of antimicrobial consumption in Latin American countries have been monitored only sporadically[13,14]. The objective of this study was to describe the trends in antibiotic consumption in eight Latin American countries between 1997 and 2007.

Materials and methods

We used routinely collected retail sales data on antibiotics (World Health Organization (WHO) Anatomic Therapeutic Chemical (ATC) code J01) between 1997 and 2007 from eight Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay, and Venezuela. Only antibiotic formulations with systemic absorption or delivery (oral or parenteral) were taken into account; excluded were products with topical and vaginal or rectal application. We chose countries with the largest pharmaceutical markets in Latin America.

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The data were derived from a health care consultancy organization, which relies on reports of a sample of retail wholesalers and, in addition, on information provided by a sample of pharmacies in some countries[15]. All data provided by the health care consultancy organization were national antibiotic sales to retail sectors (direct sales in private pharmacies and indirect sales in private clinics and hospitals) and do not include antibiotics purchased by the public sector (government providers). Given the Latin American context in which restrictions to sell antibiotics only with a medical prescription are not enforced, the data include sales both with and without prescriptions. These data represent the industry standard for estimating national retail sales volume of medications and have been widely used in stud studies of antibiotic utilization patterns[16], among them the ESAC project[3]. For analysis, we used the WHO ATC classification and the defined daily dose (DDD) system of WHO for 2008[17].

The unit of analysis provided was kilogram of sales per year aggregated by country, which we converted to defined daily dose per 1 000 inhabitants per day (DID). We obtained population information from the Pan American Health Organization database[18]. For the eight countries studied, we analyzed the trend of antibiotic consumption measured as DID between 1997 and 2007 and carried out a cross-sectional analysis of the main therapeutic groups of antibiotics consumed in 2007. We also conducted focused analyses on the use of two therapeutic classes of antibiotics: macrolide, lincosamindes, and streptogramins (J01 F) and quinolone (J01 M). They were selected because of recent observations that macrolide resistance among *Streptococcus pneumoniae* and group A streptococcus is associated with azithromycin consumption (because of its long half-life)[19, 20] and that new patterns of fluoroquinolone resistance are emerging among *S. pneumonia* as well as among enteric and genitourinary pathogens[21].

In order to calculate national rates of antibiotic utilization based on national population estimates, we adjusted the numerator for antibiotic sales volume based on the proportion of a given country's total medication market volume that was distributed via retail sector versus government[15]. These data were available for specific years for each country: 2008 data for Colombia and Uruguay; 2007 data for Argentina, Brazil, and Peru; 2004 data for Mexico; 2001 data for Venezuela; and 2000 data for Chile.

The funding source of this study did not play a role in study design; in collection, analysis, and interpretation of data; in writing the report; and in the decision to submit the paper for publication.

Results

Figure 1 presents national antibiotic utilization rates in eight Latin American countries between 1997 and 2007. In 1997, Mexico (15.69 DID) had the highest antibiotic utilization followed by Argentina (14.37 DID) and Chile (14.07 DID). The three countries with the lowest utilization in 1997 were Peru (7.91 DID), Brazil (6.51 DID), and Uruguay (5.43 DID). By 2007, Argentina (16.64 DID) and Venezuela (15.99 DID) headed the list of countries in antibiotic use followed by Peru (13.50 DID), Mexico (13.26 DID), and Chile (12.53). Significantly lower was antibiotic use in Uruguay (8.90 DID), Colombia (8.09 DID), and Brazil (7.01 DID), with the lowest utilization rates of the eight countries studied.

In terms of relative change using 1997 as a baseline, antibiotic utilization has increased in Peru (5.58 DID, +70.6%), Uruguay (3.48 DID, 64.0%), and Venezuela (4.81 DID, +43.0%), whereas in Mexico (±2.43 DID, ±15.5%) and Colombia (±4.10 DID, ±33.7%) it has declined (Table 1). Two countries, Argentina and Chile, showed major drops in antibiotic use in the middle of this period. However, Argentina has increased antibiotic use during the last few years to exceed its baseline rate (2.26 DID, +15.7%), whereas in Chile utilization is slightly lower than its baseline rate (±1.53 DID, ±10.9%). With respect to the average change (1.07 DID) in all eight countries between 1997 and 2007, Colombia showed the largest percentage decrease (±483.2%) and Peru showed the largest percentage increase (+421.5%) (Table 1).

We analyzed the distribution of antibiotic classes being consumed in each country based on 2007 (Figure 2). Penicillins were the most common therapeutic group of antibiotics consumed in all Latin American countries in our study, fol-

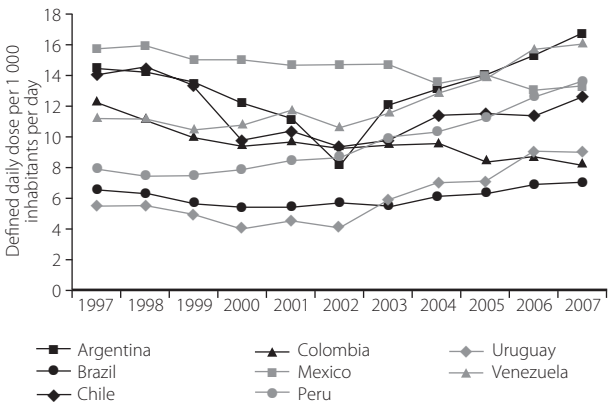

Figure 1. Trends of national antibiotic utilization in eight Latin American countries, 1997-2007.

Table 1. Changes in antibiotic utilization in eight Latin American countries, 1997–2007

Country	Antibiotic utilization, 1997 (DID)[a]	Antibiotic utilization, 2007 (DID)	Change in Utilization 1997–2007 (DID)	Percent change with respect to average change[b]	Minimum Anual Utilization 1997–2007 (DID)	Maximum Anual Utilization 1997–2007 (DID)
Argentina	14.37	16.64	+2.26	+111.2	8.11	16.64
Brazil	6.51	7.01	+0.50	–53.3	5.27	7.01
Chile	14.07	12.53	–1.53	–243.0	9.30	14.42
Colombia	12.17	8.07	–4.10	–483.2	8.07	12.17
Mexico	15.69	13.26	–2.43	–327.1	12.97	15.93
Peru	7.91	13.50	+5.58	+421.5	7.35	13.50
Uruguay	5.43	8.90	+3.48	+225.2	3.93	8.99
Venezuela	11.18	15.99	+4.81	+349.5	10.36	15.99
Latin American						
average	10.92	11.99	+1.07			

a DID, defined daily dose per 1 000 inhabitants per day.
b Average change in utilization, 1.07 DID.

lowed by the group composed of macrolides, lincosamindes, and streptogramins and the group of quinolones.

Examining 10-year trends for macrolide, lincosaminde, and streptogramin antibiotics showed large increases in Peru (0.76 DID, +82.1%), Brazil (+0.41 DID, +61.5%), and Argentina (0.74 DID, +42.0%) but relatively little change or even decreases in Uruguay, Mexico, and Colombia (Figure 3). We examined the distribution of specific macrolide antibiotics within this therapeutic class in 2007. In all countries except Argentina and Chile, azithromycin consumption was higher than that of clarithromycin (Figure 4).

Quinolone utilization increased in all eight countries studied. The decrease in overall antibiotic utilization for Chile during the middle of the period studied does not apply to quinolone antibiotics, for which sales have increased evenly over the last 11 years. Whereas quinolone utilization in Chile and Uruguay doubled (0.87 DID, +157%; 0.32 DID, +152%, respectively), in Venezuela it tripled (1.86 DID, +282%) between 1997 and 2007 (Figure 5). Quinolone use varied 5-fold among Latin American countries in 2007. Again, Venezuela was leading (2.49 DID) and Uruguay (0.53 DID) had the lowest utilization (Figure 5). The use of newer quinolones such as levofloxacin was highest in Venezuela (0.651 DID) and moxifloxacin saw the most use in Mexico (0.104 DID) (Figure 6).

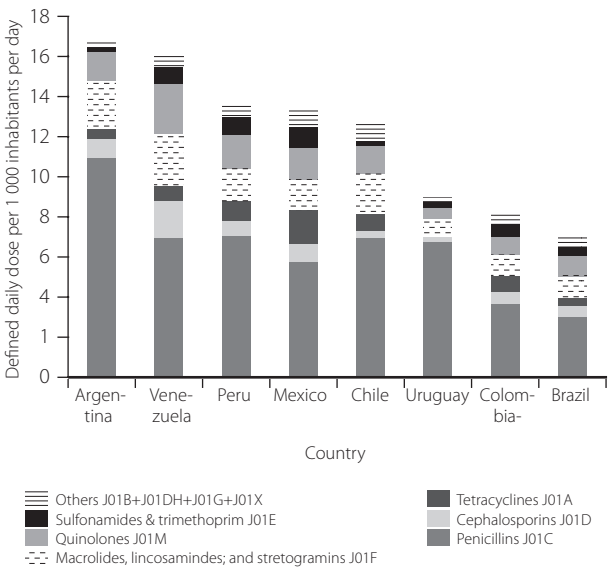

Figure 2. Antibiotic utilization in eight Latin American countries, by therapeutic class, 2007.

Discussion

There is substantial variation in the total antibiotic utilization rate and trends among Latin American countries between 1997 and 2007, with a ratio of 2.4 between the highest and the lowest consumption in 2007. Although this study cannot provide evidence on the determinants of this variation, evidence from intracountry studies[22, 23] indicates that socioeconomic factors play a role. For example, our results suggest that the economic crisis in Argentina and the subsequent collapse of public health services[24] between 2001 and 2003 was associated with

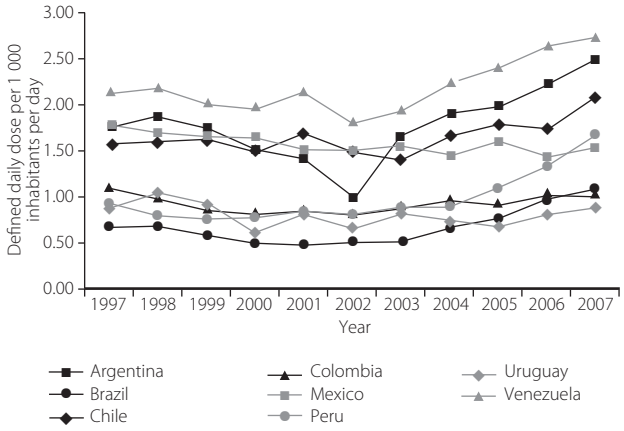

Figure 3. Antibiotic utilization in eight Latin American countries, by therapeutic class, 2007.

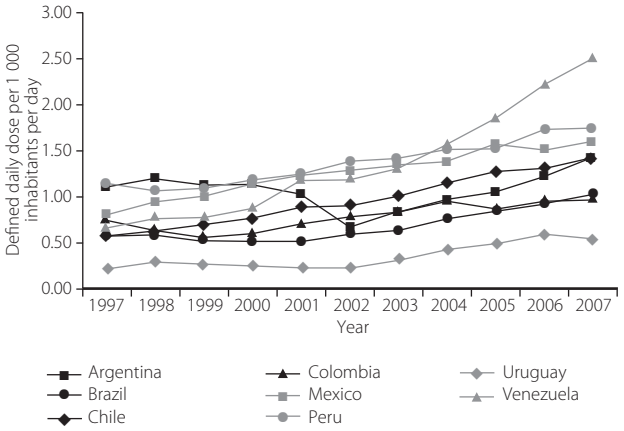

Figure 5. Quinolone utilization in eight Latin American countries, 1997-2007.

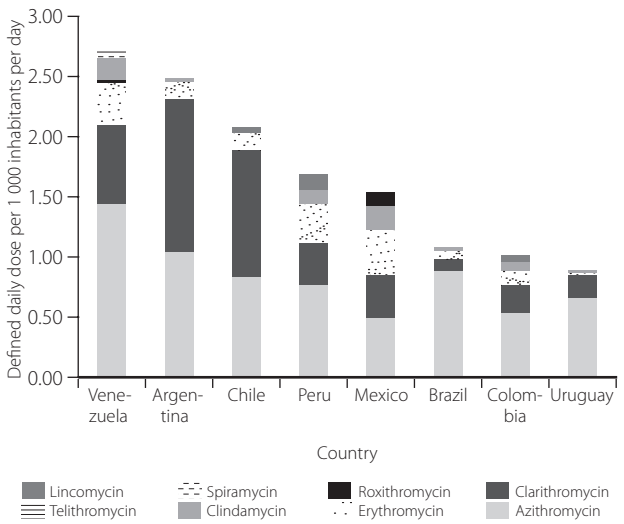

Figure 4. Utilization of macrolides, lincosamindes, and streptogramins in eight Latin American countries, 2007.

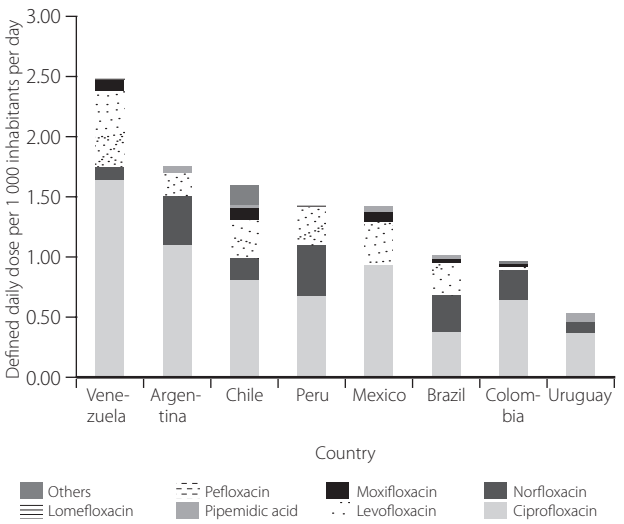

Figure 6. Quinolone utilization in eight Latin American countries, 2007.

substantial decreases in antibiotic utilization. Policy changes are also forces whose effects can be examined with these data. In Chile in 1999, the implementation of regulatory enforcement prohibiting sales of all antibiotics without a prescription in retail pharmacies, along with a mass media campaign, appeared to have major effects[25]. Although the initial success of this policy change on antibiotic use has been previously reported, our results show that these improvements appear to have been short-lived and that the greatest impact of this policy occurred shortly after its introduction and during the next two years. Unfortunately, antibiotic utilization rates have increased steadily since 2002 returning to levels close to the baseline in 1997. In contrast to Chile, regulatory enforcement prohibiting the sales of certain antibiotics without a prescription in Venezuela in early 2006[26] does not appear to have had any short-term impact on overall antibiotic utilization.

What these data cannot tell us, however, is how much of a given country's rate of antibiotic use reflects overuse, underuse, and appropriate use. For instance, in the case of large increases in antibiotic utilization that have occurred in Peru, Venezuela, and Uruguay, have health care reforms

contributed to the change in utilization by improving access to medicines via the public sector that is, increases in antibiotic utilization that might be totally appropriate? Nonetheless, understanding the utilization pattern and its trends can allow for more focused interventions or policy changes on improving antibiotic use and containing antibiotic resistance to be developed, as well as for assessing the impact of such interventions or policy changes. For example, evidence about increasing community antibiotic use was among the main forces to trigger the development of nationwide interventions in France and in Chile[7, 25]. The large increase in Uruguay and the large decrease in Colombia observed in our study warrant further scrutiny. The data also underline the need to be observant of the antibiotic-resistance patterns that could arise after the increasing consumption of some therapeutic classes, particularly macrolides and quinolones.

Although we have based this report on data that represent the industry standard, there are significant limitations that one should consider. For each Latin American country in this study, there are no regularly collected, reliable data on the percentage of the population that obtains medicines through the retail (or government) sector. People with government- sponsored insurance may purchase retail antibiotics because of convenience and lack of supply in their governmentsponsored program[27, 28]. Conversely, some people without insurance obtain their medication from government institutions (which run their own pharmacies) that provide medication access to the poor. To address this limitation, we extrapolated utilization rates for the retail sector to the entire population for each country based on the proportion of a given country's total medication market volume that was distributed via retail sector with data provided by the health care consultancy organization. This adjustment was most relevant for three countries (Mexico, Peru, and Colombia); for the other five countries in our study, the pharmaceutical retail volume covers more than 80% of the total sales volume in the country.

Although the WHO ATC/DDD system is the leading consensus method to assess and compare antibiotic use, having been used widely for benchmarking and evaluating the impact of intervene tion studies[18], there are several limitations one must consider. The DDD as a technical unit does not reflect actual treatment dose or length of therapy prescribed[19]. In addition, the DDD system cannot be applied to children, because it relates to an average adult weight[17]. Consequently, in many studies, liquid oral antibiotic preparations (intended for children) are excluded from the numerator. When children's preparations are considered (as in our study), it has been inferred that consumption is greater than what was estimated[15]. In addition to oral preparations, we included injectable preparations because they make up a considerable amount of total consumption. It is known that sales data are not equivalent to consumption as products purchased by pharmacies or by consumers might expire without having been taken; however, the information has been widely used as a proxy measure for medicine utilization at the population level.

Our study analyzes utilization at the population level but did not account for differences in income or insurance coverage, which have been identified as factors influencing utilization in European countries[9, 10]. We found no clear association between country income level or insurance coverage and antibiotic consumption, except that the reduced income during the economic crisis in Argentina seems a very likely explanation for the reduced utilization between 1999 and 2003. More research is necessary to determine factors that can explain variations in antibiotic use in Latin America. Finally, in this study we do not present any correlation between antibiotic utilization and resistance patterns, which will be the subject of a separate analysis.

Conclusion

The substantial intercountry variation and increase in antibiotic consumption between 1997 and 2007 tie well into findings of escalating antibiotic resistance in Latin America[29], which are being fueled by a combination of forces acting in concert: physicians who frequently prescribe antibiotics when they are not necessary, the public that demands antibiotics from doctors when they are not necessary or purchases antibiotics without a prescription, pharmacy staff inadequately trained to give sound advice for over-the-counter antibiotic purchases, and governments that have no political will or economic resources for enforcing policies prohibiting antibiotic sales without a prescription and implementing interventions to improve antibiotic use[11, 30±32]. The European Union is funding ESAC, which aims to create policyrelevant evidence by analyzing and comparing antimicrobial consumption patterns across Europe[33]. A similar agency in Latin America would be important to foster policies aimed at improving appropriate use of antibiotics.

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Evaluación del impacto de la investigación en la política sanitaria: conceptos y casos concretos*

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Hay muchos ejemplos de investigaciones que han influido en las políticas sanitarias. Ésta es la conclusión de una revisión de estudios acerca del impacto de programas de investigación sanitaria[1], aunque hasta ahora no ha constituido una opinión generalizada. Hasta qué punto influye la investigación en las políticas es en parte un asunto de definiciones. Sin embargo, en países como el Reino Unido se están emitiendo un número cada vez mayor de políticas sobre el trabajo clínico, y éstas se están diseñando a partir de los hallazgos de la investigación.

En revisiones recientes en torno las relaciones entre investigación y política sanitaria, se ha arrojado algo de luz sobre su complejidad[2-7]. Estos análisis se han desarrollado en el contexto de debates sobre el impacto de la investigación en la política pública, en general[8], y uno de los temas recurrentes que destaca en casi toda la bibliografía son las innegables dificultades que obstruyen los esfuerzos para utilizar la investigación en el diseño de las políticas sanitarias.

En el presente artículo se reconoce que hay numer sos obstáculos tanto en los intentos de utilizar investigación para el diseño de políticas sanitarias de manera sistemática, como en la evaluación del impacto logrado por ella. El artículo se concentra en tres objetivos principales: en primer lugar, define algunos de los conceptos generales que se utilizan en el análisis de los procesos de diseño de políticas sanitarias y el papel de la investigación en estos procesos; en segundo lugar, examina algunas de las características clave de los estudios abarcados por la revisión antes mencionada, y analiza por qué éstos indican que la investigación tiene más impacto en la política de lo que muchas revistas y análisis habían identificado en el pasado; y, por último, describe el modelo de «interfases y receptor» que se empleó para evaluar el impacto de la investigación sanitaria en la política[6]. Este modelo se construyó a partir de una corriente de investigación de largo plazo que examina las relaciones entre la investigación sanitaria y el Gobierno del Reino Unido, a la par que el posible impacto de esa investigación[9]. El modelo de interfases y receptor no pretende ofrecer, necesariamente, una explicación exhaustiva de cómo la investigación puede impactar en la política, sino, más bien, señalar algunos de los factores clave que pueden aumentar este impacto y definir los asuntos que deben tratarse en toda evaluación de impacto. Los casos de impacto en el Reino Unido y en México muestran cómo se puede aplicar este modelo para evaluar los contextos antes del impacto de la investigación, y así identificar los factores que facilitaron la consecución de este impacto.

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Conceptos generales sobre el diseño de políticas sanitarias y el papel de la investigación

En esta sección, esbozaremos algunos de los conceptos generales que se esgrimen en los debates sobre el impacto de la investigación en la política sanitaria. Se define como «diseño de políticas» el ejercido por individuos que ocupan posiciones de autoridad en la toma de decisiones y gozan de una condición especial en el interior del grupo en que éstas inciden. Una perspectiva tan amplia del diseño de políticas[10] conlleva que los resultados puedan comprender múltiples formas, como políticas sanitarias diseñadas por gobiernos nacionales o locales, políticas sobre la utilización de recursos u organización asistencial diseñadas por las unidades que proporcionan asistencia local e, incluso, directrices clínicas implementadas por organismos profesionales. En evaluaciones de impacto o rentabilidad, esta acepción del término «diseño de políticas» conlleva grandes ventajas en favor del impacto de la investigación en las políticas.

No se ha convenido en una sola tipología de políticas, sino que hay varias categorizaciones que se consideran adecuadas para examinar la investigación sanitaria en relación con el diseño de políticas[11,12]. Las tres categorías de políticas propuestas por Lomas legislativas, administrativas y clínicas 12 coinciden con la definición de diseño de políticas antes mencionada. Las *políticas legislativas* se refieren al marco global que sirve para organizar los servicios sanitarios; las *administrativas*, al funcionamiento de estos servicios y a la asignación de recursos dentro del marco global, y, por último, las *clínicas* se refieren a los tratamientos que deben aplicarse. Es recomendable contemplar las categorizaciones de políticas como una matriz donde distintos tipos de investigación tienen más probabilidad de impactar en determinadas categorías de políticas.

Al analizar el diseño de políticas en relación con la utilización de la investigación, se suelen identificar al menos tres áreas de actividad amplias: el establecimiento de la agenda, la formulación y la implementación de la política[13]. Potencialmente, la investigación tiene que ver con todas.

Son numerosas las categorizaciones del diseño de políticas. Los modelos descritos aquí se basan en análisis anteriores[14,15]. No se excluyen, sino que se incluyen mutuamente, pues cada uno brinda una contribución particular al análisis:

- *Modelos racionales.* Los modelos racionales de diseño de políticas suponen que los diseñadores identifican los problemas antes de revisar los datos sobre posibles soluciones y sus consecuencias para, al final, seleccionar la solución que mejor se ajusta a sus objetivos.
- *Modelos incrementalistas.* No es apartir de ahora que el diseño de políticas se considera un proceso complejo. Puede implicar el conocimiento científico junto con una variedad de otros factores, incluidos intereses, valores, posiciones establecidas dentro de las instituciones y ambiciones personales. En modelos como el «incrementalismo no conexionado»[16], el diseño de políticas no conlleva un movimiento claro hacia objetivos predeterminados; constituye más bien una serie de pasos pequeños en un proceso de «ingeniárselas»[17], o ir tomando «decisiones adicionales»[18].
- *Redes.* El modelo de redes subraya el papel de los diferentes intereses en el diseño y la forma en que las relaciones entre los grupos de intereses y los diseñadores de políticas pueden ocasionar un proceso de políticas incrementales. El análisis de los sistemas sanitarios indica que la profesión médica influye de forma poderosa en el diseño de las políticas en este sector[19]. Incluso, el dominio que ésta ejerce en las redes políticas ha conducido al uso del término «red política profesionalizada»[20]. Es probable que esta influencia sea un factor decisivo en el establecimiento de las agendas y la determinación del tipo de conocimiento que predomina en los debates sobre políticas.

En esta categorización de diseño de políticas, se entiende por qué hay la creencia que la investigación difícilmente puede producir un impacto significativo en las políticas. No obstante, en oposición a esta postura, se puede argumentar que las políticas basadas en la investigación serán siempre mejores que las que no lo están. Es evidente que la investigación expone el proceso de diseño a una mayor variedad de experiencias y conceptos validados que los que se manejan en los procesos normales de deliberación, limitados en el tiempo y políticamente constreñidos. Ciertamente, la investigación conduce a la emisión de políticas con bases técnicamente informadas. En la presente categorización, se mencionan las razones por las que algunas políticas han tenido éxito y otras no. Además, se pueden apreciar los vínculos entre factores que normalmente se perciben como separados, como la naturaleza del campo sustancial y los patrones organizativos que se han establecido para controlarlo, así como el poder del entorno sobre las condiciones sanitarias[6,21].

A raíz del trabajo de Weiss[22] y otros[21,23,24], se han identificado diversos modelos de utilización de investigación para el diseño de políticas, cada uno aplicable en diferente momento del diseño.

- *El modelo clásico/purista/guiado por el conocimiento.* Sigue una secuencia lineal, donde la investigación genera conocimientos que impulsan la acción.
- *El modelo de solución de problemas/ingeniería/guiado por la política.* También sigue una secuencia lineal, pero comienza con la identificación de un problema por un cliente que solicita a un investigador identificar y valorar soluciones.
- *El modelo interactivo/interacción social.* Trata de un conjunto de interacciones entre investigadores y usuarios, más que un movimiento lineal desde la investigación hasta la toma de decisiones. Garantiza que cada uno esté expuesto al entorno y a las necesidades de los demás.
- *El modelo de la ilustración/colación/«piedra caliza».* Aquí es probable que la investigación se utilice como una «sedimentación» gradual de perspicacia, teorías, conceptos y diferentes puntos de vista. Este modelo ofrece la ventaja de ampliar el abanico de vías para utilizar la investigación.
- *El modelo político.* Aquí los hallazgos son argumentos en un sistema adverso de diseño de políticas.
- *El modelo táctico.* La investigación se utiliza cuando hay presiones para que se implementen acciones en relación con un tema y los diseñadores de políticas responden anunciando que han encargado un estudio de investigación al respecto.

Hay puntos de convergencia, más no una correspondencia absoluta, entre las características principales de los modelos de diseño de políticas aquí analizados y los diversos procesos de utilización de investigación. Weiss indica que se puede concebir y utilizar la investigación para el diseño de políticas de tres maneras fundamentales: a) como datos y hallazgos; b) como ideas y críticas bajo el modelo aquí ilustrado, o c) como resúmenes y argumentos para tomar acción[25]. Además, la utilización de la investigación en el diseño de políticas puede considerarse instrumental, conceptual o simbólica[13]. El uso instrumental implica que los hallazgos se utilizan directamente en el diseño; el conceptual se refiere a cómo se utilizan y, por último, en el simbólico, la investigación se utiliza para apoyar una posición ya establecida, que puede ser incluso la de mantener las políticas actuales. Se considera cada vez más importante agrupar los hallazgos de los estudios individuales en revisiones sistemáticas, con el fin de proporcionar evidencia más contundente para el diseño de políticas[26].

Del análisis de conceptos generales arriba expuesto se desprende que la investigación puede influir en las políticas sanitarias de muchas maneras, y que la evaluación de los diferentes niveles de impacto puede constituir una tarea compleja, la cual examinaremos en detalle a continuación.

Revisión de estudios que abarcan las condiciones previas al impacto de la investigación

Muchos análisis se han centrado en los obstáculos a los intentos de utilizar la investigación en el diseño de políticas. La revisión referida en este artículo ha logrado identificar específicamente las evaluaciones de programas de investigación sanitaria que han tenido más impacto (tanto en la política como en la práctica y ganancia sanitarias) y que se han publicado en inglés[1]. Durante esta revisión se identificaron 17 programas de investigación, cada cual con múltiples proyectos. En promedio, la proporción de proyectos por programa fue alta, y se detectaron sólo tres programas en los cuales menos del 30% de sus proyectos había logrado algún impacto. En algunos casos, los programas eran evaluaciones de tecnología sanitaria (ETS), donde prácticamente todos los proyectos de investigación influyeron en las políticas. De hecho, varios estudios abordaron el impacto del programa ETS en Quebec[27,28], donde todos los proyectos influyeron en la política: uno de ellos condujo a un aumento en la detección sistemática de cáncer de mama, y otro, a una reducción en las radiografías torácicas preoperatorias habituales28. Hubo estudios incluidos en la revisión que utilizaron el Modelo Payback de Buxton y Hanney[23], que indicó que entre el 30 y el 50% de los proyectos habían ejercido algún impacto en las políticas.

Se analizaron también estudios sobre el impacto de programas de investigación publicados posteriormente a la fecha tope, para incluirlos en la revisión antes mencionada. Entre ellos figura la evaluación de rentabilidad de la investigación financiada por TV3 Telethon en Cataluña, la cual mostró que efectivamente la investigación había producido un impacto en la política[29]. En otro estudio realizado en la Escuela de Salud e Higiene Tropical de

Londres se concluyó que los estudios de caso «habían destacado una amplia variedad de áreas en las que la investigación había tenido influencia en los servicios sanitarios y en las políticas»[30]. Por ejemplo, uno de los proyectos influyó en la política del Instituto Nacional de Salud y Excelencia Clínica con respecto a técnicas quirúrgicas para la amigdalectomía; y otro sobre la morbimortalidad asociada a la temperatura en el hogar influyó en la legislación sobre viviendas en el Reino Unido[30]. Por último, la evaluación de rentabilidad del programa de Evaluación de Tecnología Sanitaria en el Reino Unido detectó numerosas políticas clínicas relacionadas con la investigación de los programas evaluados[1]. Un ensayo controlado y aleatorizado de 3 estrategias de tratamiento y rehabilitación de ictus[31] influyó en las directrices clínicas nacionales referentes a la provisión de especialistas en las unidades de ictus: algunas establecidas por el Colegio Real de Médicos en Inglaterra[32] y otras por la Red Escocesa Intercolegial de Lineamientos[33]. Entre las técnicas empleadas por los estudios de impacto de la investigación, incluidos en la revisión antes mencionada, figuran: análisis de contenido, encuestas, entrevistas y estudios de casos[1]. Al considerar por qué estos estudios indicaron un impacto mayor que muchos análisis en el pasado, se detectó que la mayoría de ellos contenían probables fuentes de sesgo: muchos los patrocinó la organización que había financiado la investigación en primer lugar, y algunos los habían realizado investigadores de esa organización. Además, muchas de las fuentes de datos empleadas se obtuvieron, al menos parcialmente, de investigadores que participaron en los proyectos evaluados[1].

Hay, sin embargo, buenas razones por las que la mayoría de las evaluaciones incluidas en esta revisión reportaron un impacto mayor que muchos estudios anteriores[1]. En primer lugar, como criterio de inclusión en la revisión, las evaluaciones debían realizarse desde un programa identificable de investigación. Esto proporciona un foco más estrecho que otros estudios que comienzan analizando un área de política o desarrollo, y luego retroceden para evaluar el impacto de alguna investigación. Los estudios que indagan hacia delante tienen más probabilidad de captar cualquier impacto de investigación en el proceso de diseño de la política, por muy reducido que éste sea. Además, muchos de los estudios provienen de programas de evaluación de tecnologías y de investigación sanitaria aplicada, donde el papel del receptor (o cliente) en la recepción y la utilización de la investigación suele ser un factor importante a favor del impacto[1].

El modelo de «interfases y receptor» para evaluar el impacto de la investigación

En el análisis realizado en el Reino Unido hace más de 25 años por Kogan y Henkel[9,21], se indicó que en los casos donde se utiliza investigación en el diseño de políticas es deseable aplicar, aunque resulte difícil de lograr, un método de colaboración entre diseñadores e investigadores. En este análisis se indican los problemas relacionados con los límites o las interfases clave, y se describen algunos pasos necesarios para conseguir un impacto mayor de la investigación, como el desarrollo de los agentes del conocimiento y el fortalecimiento de la capacidad de los organismos receptores para recibir los hallazgos de la investigación. Esta corriente de investigación la desarrollaron los colegas de Kogan y Henkel para elaborar el denominado Modelo Payback[23].

Al valorar el impacto de la investigación, es útil disponer de un marco de trabajo conceptual para organizar los instrumentos de recolección de datos y las explicaciones reportadas. El Modelo Payback proporciona este entorno y el modelo de «interfases y receptor» lo complementa cuando el foco del estudio se refiere al impacto de la investigación en las políticas[6]. Sin embargo, este modelo va aún más lejos: no sólo ayuda a identificar los factores relevantes a la consecución del impacto, sino que también ofrece un modelo preceptivo en cuanto a formas de aumentar la rentabilidad a partir de la investigación sanitaria.

El modelo de «interfases y receptor»: el papel de las interfases

El concepto de interfases facilita el análisis de los asuntos que surgen en la relación entre diseñadores de políticas e investigadores[23]. En primer lugar, es útil cuando los investigadores y los diseñadores pertenecen a dos culturas o comunidades con diferentes valores, idioma, sistemas de gratificación y afiliaciones sociales y profesionales[34], lo que a veces implica dificultades para interactuar de forma constructiva. En segundo lugar, contribuye al análisis de la idea generalizada de que los diseñadores de políticas y los investigadores manejan diferentes escalas de tiempo. Esto lo describió claramente el Dr. Julio Frenk antes de su nombramiento como secretario de Salud de México, al afirmar que los diseñadores de políticas son cronofóbicos y los investigadores, cronofílicos[35]. En tercer lugar, el concepto de permeabilidad en las interfases[23] contribuye

a nuestro análisis en el sentido siguiente: si bien es cierto que los diseñadores necesitan animar a los investigadores a que acepten y comprendan sus problemas, es deseable que estos últimos mantengan cierto grado de impermeabilidad, o autonomía, sobre asuntos como sus métodos de investigación.

Hay muchas interfases indirectas; sin embargo, aquí describiremos los enlaces directos entre el sistema de investigación sanitario y los diseñadores de políticas. En primer lugar, la interfase del establecimiento de prioridades, de la evaluación de necesidades y de la contratación de investigación. En segundo, la interfase de la diseminación y transferencia del conocimiento. El establecimiento de prioridades suele funcionar de forma más efectiva cuando hay una lista de intereses, de manera que los diseñadores de políticas puedan expresar cuáles son sus demandas y los investigadores, definir qué es investigable. También es útil el método iterativo[6]. El método de colaboración es considerado importante y se facilita cuando hay comités de diseñadores de políticas e investigadores de largo plazo. En esta interfase, es recomendable emplear un método para potenciar la síntesis de evidencia a fin de que los diseñadores involucren a los investigadores en la revisión de pruebas antes de establecer las prioridades. Es posible que los investigadores no estén dispuestos a trabajar en una agenda con la que no concuerdan, o que propongan proyectos que desvían las intenciones originales de los diseñadores. Es más factible lograr un compromiso por parte de los investigadores cuando éstos se involucran en el establecimiento de las prioridades. Centros de investigación con financiamiento a largo plazo pueden facilitar, de manera importante, la interacción entre diseñadores e investigadores, y ayudar a precisar las percepciones de cada uno6. Mediante su concepto de «vinculación e intercambio», Lomas plantea argumentos hacia un contacto mayor entre ambos grupos durante todas las etapas del proceso de investigación[36].

En la interfase de comunicaciones o de transferencia de conocimiento, hay mecanismos que favorecen la permeabilidad entre los actores; entre ellos, los resúmenes de políticas por parte de los investigadores y la utilización de la investigación o de agentes de conocimiento que tomen los hallazgos de los investigadores y ayuden a transferirlos a los diseñadores de las políticas[21,23]. Los comités de especialistas a largo plazo en los que diseñadores e investigadores trabajan conjuntamente facilitan la transferencia de hallazgos, así como los centros de investigación antes mencionados.

El modelo de «interfases y receptor»: el papel de los receptores

La idea de los diseñadores de las políticas como receptores de los hallazgos de investigación[6,13,21] encaja con el concepto de «utilización en escalera» de tales hallazgos[37], en el que la utilización de la investigación en el diseño de políticas representa una serie de escalones. Éstos comienzan con los asuntos de la interfase de transmisión de hallazgos a los diseñadores y avanzan hacia los asuntos del receptor, incluidas la absorción y la revisión sistemática de pruebas, así como su utilización en el diseño. Aunque los receptores son los responsables de estas funciones, el sistema de investigación puede participar facilitando el uso de la investigación por medio de mecanismos, como la capacitación para la realización de revisiones sistemáticas. El éxito del papel de receptor está ligado a diversos factores, como la creación de sistemas que garanticen que las prioridades establecidas reflejen las necesidades de los diseñadores. Otro factor es el desarrollo de vínculos a largo plazo que aporten a estos diseñadores una visión realista de la investigación. Posiblemente, lo más importante sea atender de forma cuidadosa los asuntos de capacitación, cultura y estructuras organizativas de los organismos receptores[6,9].

Aplicación del modelo de «interfases y receptor»

Hay un plan ya desarrollado para implementar el modelo de interfases y receptor[6], que sirve también para identificar los factores que contribuyen a que la investigación produzca un impacto. A continuación se analizan dos casos concretos.

Impacto de un proyecto en la carrera de mujeres médicas en el Reino Unido. Este proyecto[38] incluyó acciones clave en las interfases. El Departamento de Sanidad del Reino Unido fungió como organismo receptor y trabajó con el investigador para desarrollar el proyecto en la interfase de especificaciones y asignación de la comisión de investigación. Una vez concluido el proyecto, en la interfase de diseminación, el ministro de Sanidad contribuyó en la venta de los hallazgos al personal clínico, y en una reunión organizada para comunicar estos hallazgos comentó que éstos tenían enormes implicaciones para la política del Gobierno y para la profesión médica en sí[39]. Otro funcionario clave con antigüedad en el Departamento de Sanidad se

involucró también, y promovió la aceptación del informe. En un tema de esta envergadura, se consideró una gran variedad de evidencia y los hallazgos de este proyecto formaron parte de un amplio movimiento a favor de la política en cuestión[39]. El modelo de «interfases y receptor» ayudó a analizar este caso e identificar los factores que incidieron en el impacto logrado.

El caso de la investigación de los sistemas de salud en México. En 1994, la Fundación Mexicana para la Salud (FUNSALUD), siendo el Dr. Julio Frenk vicepresidente, publicó un estudio denominado «Salud y Economía» en torno a una serie de herramientas, incluidas las cuentas nacionales de salud, los análisis de rentabilidad de un paquete de intervenciones esenciales en salud y un mapa de las políticas de salud. El patronato de la Fundación financió este estudio por un total de medio millón de dólares, duró dos años, y contó con una nutrida participación de decisores e investigadores tanto del ámbito nacional, como internacional. Un consejo consultivo internacional, formado por investigadores y diseñadores de políticas de alto nivel, apoyaron el establecimiento de prioridades para la investigación y la supervisión de los resultados. Los resultados se difundieron de forma amplia mediante diarios, resúmenes de políticas, resúmenes ejecutivos, un informe detallado y una propuesta de políticas.

Este esfuerzo produjo beneficios inmediatos que se registraron en diversos niveles, a saber: se fortaleció la capacidad de investigación y dentro de FUNSALUD se institucionalizó el Centro de Estudios de Economía y Salud, el cual ha seguido produciendo bases de datos y análisis relevantes al esfuerzo original. También se estableció el Centro de Referencia Internacional de Iniciativas de Reforma del Sector Salud, como interfase entre los investigadores y los diseñadores de políticas involucrados en esta reforma. Por otra parte, el secretario de Salud continúo adoptando recomendaciones referentes a las políticas, especialmente en cuanto al desarrollo de fórmulas para asignar recursos a partir de la equidad. Sin embargo, el impacto más importante del estudio Economía y Salud no se constató hasta el año 2003, cuando México implantó el Sistema de Protección Social en Salud (SPSS), un esfuerzo de reducción de gastos catastróficos en salud mediante la ampliación universal del seguro de salud, dirigido por el Dr. Frenk, ya en su cargo de secretario de Salud federal. Para entonces, la Secretaría de Salud había institucionalizado las cuentas sanitarias nacionales y los diseñadores de políticas habían desarrollado una gran destreza en su aplicación. El SPSS se formuló a raíz de los desequilibrios financieros arrojados por las cuentas sanitarias nacionales, incluidos los índices bajos de inversión, la elevada proporción del gasto en salud destinada al pago de sueldos y las desigualdades financieras entre los diversos grupos poblacionales. Los análisis de rentabilidad de este proyecto ayudaron a justificar un paquete de intervenciones esenciales de salud.

En este caso, el apoyo y las pruebas de la investigación ayudaron a convencer al Congreso de México de que la inversión en el SPSS era sensata y fiscalmente, responsable. Sobre esta base, el Congreso autorizó incrementar el presupuesto del SPSS por un punto porcentual del producto interior bruto entre los años 2004 y 2010, a fin de lograr la cobertura universal del seguro. Por otra parte, las políticas se beneficiaron tanto de inversiones en investigación basadas en las plataformas y herramientas de este estudio, como de estudios posteriores orientados a precisar las estimaciones sobre políticas, valorar los procesos y evaluar los resultados logrados por él a la fecha. Como consecuencia, la diferencia entre el gasto en salud per cápita de los beneficiarios de seguridad social en el sector formal frente al de los beneficiarios del SPSS en el sector informal disminuyó de 2,44 en 2003 a 1,75 en 2006.

El estudio del caso de México ilustra tanto los grados de influencia y rentabilidad que la investigación puede alcanzar, como las escalas de tiempo en que éstos se pueden producir. La investigación de los sistemas de salud ayudó al secretario de Salud, como rector del sistema de salud mexicano, a ganar confianza en un régimen democrático. Se puede afirmar que el aumento de presupuesto citado y su impacto en la equidad constituyen un indicador claro de que resulta rentable invertir en la investigación sobre los sistemas de salud a medio plazo. Además, el caso de México ilustra los beneficios que brinda la estabilidad de las políticas en cuanto a garantizar la madurez de las inversiones en la investigación. A corto plazo, aunque muchas decisiones se han tomado en un marco de trabajo racional, con el tiempo, ha aparecido una red de políticas basadas en la evidencia y tendientes a ella. La comunicación que se abrió, e incluso la «puerta giratoria» que se evidenció, entre las comunidades de investigadores y diseñadores de políticas de ámbito nacional e internacional ha sido una interfase crítica en este sentido. Esto conlleva un riesgo de fuga de cerebros, pero, a la vez, ofrece una oportunidad para aumentar las interacciones y potenciar la toma de decisiones a partir de la evidencia, sobre todo cuando el diseñador de las políticas ha sido el propio investigador.

Conclusiones

A pesar de las interacciones complejas y variadas que hay entre la investigación y el diseño de políticas, se puede identificar un número mayor de casos de investigación con impacto en políticas de lo que se suele creer. Y este campo se está desarrollando constantemente con investigaciones nuevas e importantes que amplían el rango de las evidencias40. El modelo conceptual de las «interfases y receptor» ofrece un marco de trabajo útil para organizar los estudios de impacto, y analizar de forma empírica los factores susceptibles de aumentar las posibilidades de superar algunas de las dificultades más relevantes en el logro de un impacto, y así incrementar la incidencia de la investigación en el diseño de las políticas.

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Improving nutrition in Mexico: the use of research for decision making*

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The National Institute of Public Health in Mexico (Instituto Nacional de Salud Pública, INSP), an institution devoted to public health and nutrition research, has defined its vocation as research conducted with the aim of improving health conditions in the population. This type of research, referred to by Frenk as "research with a mission",[1] has been defined as "the development of a research effort to modify reality through producing knowledge and technology". The "mission" is precisely that change in reality.

The aim of research with a mission in public health is to improve the health conditions of the population through application of the scientific method to the study of several objects and levels of analysis. The objects are the health conditions and the organized social response (policies, programs, and actions) for preventing and controlling those conditions. The levels of analysis include subcellular particles (molecular biology), individuals (clinical research), populations (epidemiological research), and health systems (systems research). A multidisciplinary approach is used in order to generate knowledge directed toward solving the public health challenges. An important aspect of research with a mission is the use of scientific evidence for decision-making in public health, including that which affects the design and evaluation of health and nutrition policies.

The Centre for Research on Nutrition and Health (Centro de Investigación en Nutrición y Salud or CINyS) at INSP, inspired by the philosophy of research with a mission, has developed a guideline for defining the research agenda at CINyS.

The research sequence as applied to malnutrition problems (Figure 1) starts with a study of the nutritional conditions (magnitude and distribution of malnutrition problems in the population and its determinants) and the social responses (policies and programs with potential impact on malnutrition), and it continues with the following investigations: studies about the functional consequences or health impact of malnutrition on populations in order to determine the relevance of the problems; studies about the etiology and the social and biological mechanisms of malnutrition; studies about the design and testing of small-scale actions or interventions; efficacy studies (conducted under controlled conditions of delivery and utilization of interventions); and effectiveness studies or large-scale program evaluations conducted under regular program operating conditions and including evaluations of the process and cost-effectiveness of interventions. The

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process ends with the design and evaluation of policies and programs in order to provide feedback for decision making. The results of these evaluations are useful for identifying operational or design problems that generate new research questions. Such questions, when answered, nurture the research-with-a-mission cycle at some point within the process (Figure 1). During the process, it is imperative that researchers and government stakeholders in charge of designing and operating nutrition and public health policies interact actively.

The following is a summary of how the use of this research framework has provided results that have been applied to the design of policies and programs aimed at preventing malnutrition in Mexico. Several results that have been useful in reducing malnutrition also have served to provide fundamental knowledge in the field and have been published in peer-reviewed journals. Given space limitations, only some of the stages are described.

Magnitude and distribution of nutrition problems in mexico (study of the conditions)

An important function of CINyS is the implementation and analysis of national probabilistic surveys that collect data about the nutritional status of the Mexican population and those determinants that affect the nutritional status. Three national nutrition surveys have been conducted and/or analyzed by CINyS, in 1988, 1999, and 2006. Through publications and presentations aimed at officials in charge of the design and operation of policies and programs, the results of the 1999 survey prompted several actions, policies, and public programs to prevent malnutrition. For example, following the 1999 survey that identified the most important micronutrient deficiencies in the Mexican population, milk, which had been distributed by a federal program to low-income populations for several decades, was fortified with those micronutrients and became a vehicle for improving the micronutrient status of the population.

Organized social response: nutrition policies and programs in mexico

Mexico has a long history of implementing programs and policies oriented toward improving nutrition in vulnerable groups, and it has invested large amounts of financial resources in food-assistance programs. At the beginning of the 1990s, the Mexican government spent about 2 million dollars daily in food-aid programs, including programs that subsidized consumption. Nevertheless, rates of malnutrition, anemia, and micronutrient deficiencies remained high, and the decline in the prevalence of stunting, an indicator of chronic malnutrition, was less than what was expected during the 1990s, despite the high investment in food-aid programs.

These observations led to the analysis in 1988 of several aspects of governmental food aid. Valuable findings from a survey conducted that year, which assessed the magnitude and distribution of food aid as well as the nutritional needs of the population, were used by CINyS to influence the design of nutrition policies during the 1990s.

It came to light that one of the reasons for the low efficacy of nutrition programs in Mexico was the lack of

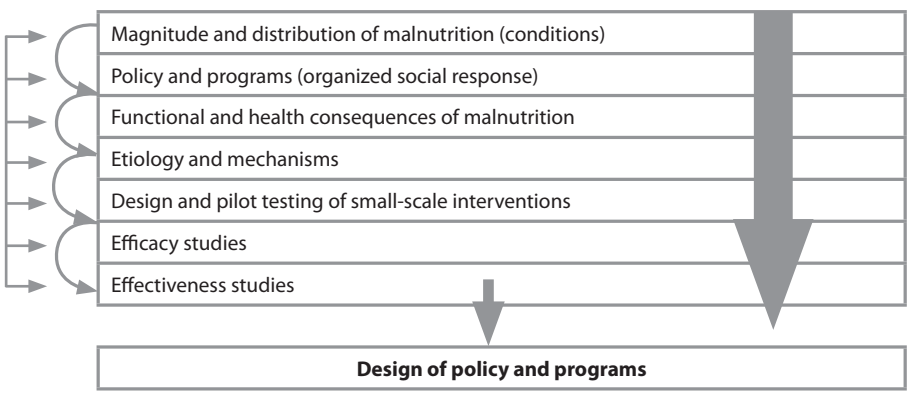


Figure 1. Stages in the process of "research with a mission" as developed by CINyS.

appropriate targeting. For example, of almost 2 million children with stunting in 1988, close to 45% were living in the southern, poorest area of the country, while less than 9% of stunted children lived in Mexico City. In contrast, 51% of the families with children younger than 5 years of age who were beneficiaries of the food-aid program were living in Mexico City, while only 15% were from the southern area, the region with the highest prevalence of stunting (Figure 2).

Besides an emphasis on urban areas, a lack of targeting was found for regions with the highest prevalence of malnutrition as well as for the poorest families, the indigenous groups, and children younger than 2 years of age. It was found that the food distributed was inadequate for children between 6 and 24 months of age, that there was a lack of coordination between programs, leading to duplicity of efforts and benefits, and that the educational component was weak.

These results were useful for modifying the basis of nutritional policies and programs at the end of the 1990s.

Effectiveness studies to evaluate actions and programs

Presented here is information on the evaluation of the effectiveness of the program *Oportunidades* and its impact on the nutritional status of participating children.[2] The benefits provided by the program include the distribution of a micronutrient-fortified food supplement, which was specifically designed to meet nutrient deficits in infants 6±23 months of age.

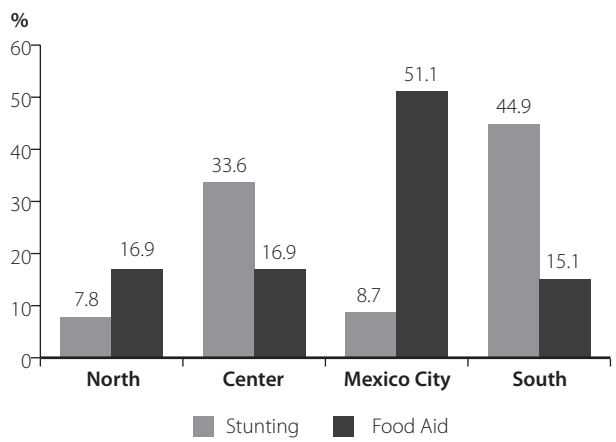
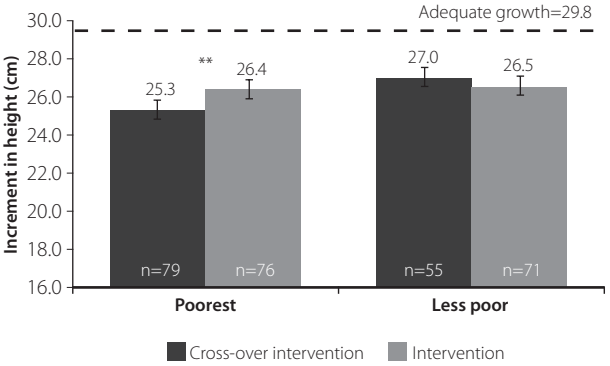


Figure 2. Stunting and food-aid distributions by region.

The program initially included approximately 300,000 homes. As it was not possible at that time to immediately cover the total target population, an evaluation study was planned with a randomized design. Several localities were randomly assigned to one of two interventions, the first one consisting of receiving program benefits for 2 years, and the second consisting of receiving benefits after 2 years, when the study was concluded. The study design was followed rigorously for the first year (1998± 1999). Nevertheless, although it was unplanned, both groups received the benefits of the program in the period 1999±2000. For this reason, the group that received the benefits of the program from the beginning was deemed the intervention group, while the other, which received the benefits only in the second year, was classified as the "crossover intervention group", as it started out as a control group but later became the intervention group during the second year. Despite the change in the original study design, it was still possible to evaluate the effects of the program over 2 years, since the intervention group received the benefits for 2 years, while the crossover intervention sample received them for half the time. Moreover, the intervention group received the benefits during the critical first two years of life, while the crossover intervention group did not receive benefits during a substantial part of that period. The greatest impact was expected for infants younger than 6 months in 1988, reflecting those who belonged to the intervention group that received the benefits of the program during the critical first 2 years of life. In contrast, those infants in the crossover intervention group received benefits for only 1 year, starting at 12±18 months of age; thus, they did not receive benefits during most of the critical period. It was also expected that the greatest effects would be found in children from the lowest income level, since the prevalence of malnutrition was greatest in that group. For these reasons, all comparisons were made after groups were stratified by age (<6 months and 6±12 months at enrollment) and socioeconomic level (lower than average or higher than average).

The effects of the program (Figure 3) were significantly higher in the intervention group compared with the crossover intervention group, but only in the group of infants younger than 6 months of age in 1998 from families of the lowest socioeconomic level ($P < 0.046$). There was no effect found in the group of infants from higher socioeconomic levels, nor in the group of older children.

With regard to anemia, since the effects take place over shorter periods, it was possible to evaluate the impact of the program in 1999, when the intervention group had



* Adjusted for age and height in 1988 (random effect models). ** P<0.05

Figure 3. Adjusted increment in height (1998–2000) in children <6 months of age at baseline who were exposed to the *Oportunidades* program for 2 years (intervention group) versus those exposed during the second year only (crossover intervention group). Data from Rivera et al. (2004).[2]

already received the benefits of the program for 1 year, whereas the crossover intervention group had not. After adjusting for age, the prevalence of anemia was found to be significantly higher in the crossover intervention group (which had been a control group in the first year of the study) than in the intervention group (Figure 4). The effect of the program was 10.6 percentage points, almost 20% in relation to the crossover intervention group.

The results of this effectiveness study of a program with current coverage of 5 million homes provided a sound basis for reaffirming the success of the program and supporting its continuation. Other results have also been useful for evaluating the program, providing feedback to the program, and suggesting modifications to its design. What follows is an example of how the evaluation results have been used to modify the program.

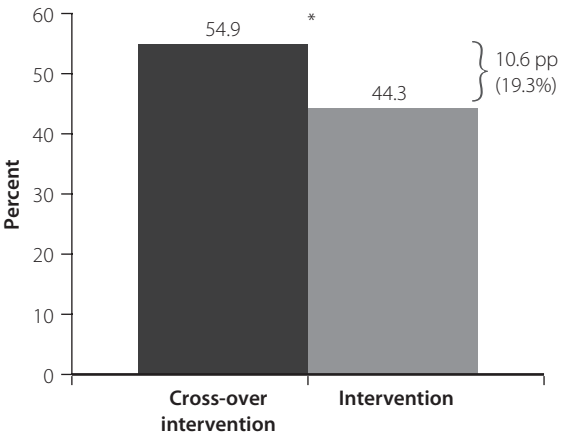
Use of the results of the evaluations for modifying program design

One result from the effectiveness evaluation that led to modification of the program's design was the lower-than-expected impact of the program on the reduction of anemia as evidenced by the lack of improvement in iron levels in children using the supplements.[2] CINyS had identified that the type of iron used was reduced iron, which is absorbed to a substantially lower degree than other forms of iron. As a result of this information, a study on the absorption of two other forms of iron (ferrous sulfate and ferrous fumarate) used to fortify food supplements were carried out and showed adequate levels of absorption.[3] Sensory and stability evaluations showed that the food supplements fortified with these new forms of iron complied with standards. This information led to a recommendation to modify the formula by exchanging the reduced iron form for one of the other fortificants. As a result, the food supplements are currently fortified with iron sulfate.

Conclusion

The manner in which the principles of research with a mission[1] have been applied to the design of the research agenda at CINyS has been described. Applying these principles has generated useful knowledge to influence the design of new policies and public nutrition programs and to modify current programs and policies.

The evidence presented demonstrates the usefulness of applying research results from CINyS toward the design of new policies and nutrition programs in Mexico. Briefly, CINyS is conducting strategic research with an effective mission, thanks to the combination of 1) an institutional framework that provides INSP with an advisory role in the health sector; 2) a favorable environment



[a] Adjusted for age using GEE
* P<0.05

Figure 4. Prevalence of anemia in children exposed (intervention group) and children not exposed (crossover intervention group) to the *Oportunidades* program for 1 year. *Abbreviations:* GEE, generalized estimating equations; pp, percentage points. Data from Rivera et al. (2004).[2]

of more than 10 years of experience, characterized by a staff with a vision for the role of research in making decisions about public policies; 3) institutional authorities committed to doing research with a mission; and 4) the dynamism, diligence, and high standards of a research group that has achieved credibility from the authorities responsible for public health nutrition policies.

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Health services decentralization in Mexico: formulation, implementation and results of policy*

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Decentralization has been defined as the transfer of authority for parastatal organizations, local governments and non-governmental organizations (Rondinelli and Cheema 1983). This strategy has been promoted by various governments and agencies in developing countries as part of administrative reforms seeking equity and efficiency. These measures follow the belief that excessive centralization increases economic and social costs, as well as being a source of political disturbance (World Bank 1987). The World Health Organization thus sees decentralization as a means of achieving greater coordination and responsiveness to local needs through delegation of responsibility, authority and resources to the community and to intermediate levels (WHO 1980). Generally, decentralization has been praised as a means, of obtaining community participation and promoting local responsibility for health (Mills et at. 1987).

Decentralization is not a clear-cut concept and is fraught with ambiguity. Thus, what at one level may be seen as administrative decentralization, at another may imply greater power to the central political authorities. This is particularly the case with the form of decentralization called delegation, where anew, parastatal organism is created at the margin of the central bureaucracy. Through circumventing central bureaucratic interests and social and political pressures, delegation may enhance the central authority's power to target and deliver key social services. This power often implies highly centralized decisionmaking, isolated from sectoral integration mechanisms or social participation.

Decentralization has usually been encouraged from a conviction of its supposed benefits, with little thought being given to its putative tages for health care. This occurs ministrative reform responds to the economic and political context in which it is set, rather than being a means of implementing the coverage extension and equity objectives which are always emphasized (Gonzalez-Block and Frenk in press). It has thus been argued that decentralization is a way of transferring some responsibilities for development from the centre to the periphery, and in consequence, of spreading the blame for failure to meet rural needs. This argument is particularly relevant in situations of economic and fiscal crisis, when social needs increase, central resources dwindle, yet governments seek legitimation (Friedland et al. 1978). Decentralization must then be examined as an answer to substitute the sources of finance for social services, to protect key political interests and to refashion a democratic image.

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This article explores the technical and political motivations of health service decentralization in Mexico, and assesses its implications for the areas of finance, planning and health service delivery and equity. The focus is on the shortterm results of decentralization in the most underdeveloped region of the country -the south -a region comparable with the central American countries and other least-developed nations in the world.

Centralization and fragmentation of the health sector

Health service centralization in Mexico was a phenomenon closely tied to the phase of import substitution in the economy that started with the Second World War. Health policy supported economic growth through abstract, technical approaches far removed from peasant organizations and closer to the vertical, corporatist industrial leadership. The Ministry of Sanitation and Assistance (SSA), and the Mexican Institute of Social Security (IMSS), were created to implement these policies through greater federal finance and control. Indeed SSA went on to build hospitals nationwide entirely dependent on federal monies and decisions, thus bringing down state governments' finance from 50% to less than 10%. Although the social security institute was formally decentralized as a tripartite parastatal organism, the federation maintained firm political control and used it as a powerful negotiating tool controlling capital and labour.

From the early 1970s Mexico faced a stagnant economy, greater social inequalities and widespread discontent with government. The political crisis led central authorities to press against the industrialists with a policy of 'social solidarity' through which the IMSS would collaborate with the federal government to provide medical and preventive care to the organized peasantry. However, the IMSS was also charged with implementing the programme through its own autonomous administration, without any control by the Ministry of Health or participation from local communities. It is no surprise, then, that once political pressure eased, the programme was all but terminated, bringing financing down from 1.3% of the Institute's budget in 1976, to 0.3% in 1979 (Spalding 1980).

From the late 1970s centralization and fragmentation started to be seen as a political liability. However, poverty was becoming an ever more threatening issue, leading with the oil boom to a new wave of centralization, this time combined with mild efforts of central and regional coordination. On the one hand delegated institutions were strengthened and coordinated at the presidential level through a special body, called COPLAMAR; on the other hand, federal planning was deconcentrated through state-level planning committees (COP LADES), where federal delegates were motivated to coordinate through tying part of their budget to state-level consolidated development agreements (CUD).

Centralization and fragmentation in health policy deepened as IMSS participated through COPLAMAR in a drive towards health service extension for the rural poor. IMSS was chosen for its capacity to plan and deliver more than 3000 clinics ill the most dispersed areas of the country, all in less than two years. The programme was to be financed wholly through federal funds, and would not link up with the urban worker's infrastructure. Furthermore, it did not imply any legal or financial responsibilities for redistributive social solidarity. However, the programme was mounted on the same tracks and with the same social solidarity image as the previous programme, giving a boost to the Institute's welfare role without any of its previous costs.

The new wave of centralization meant that health issues and planning were left out of the regional coordination bodies, furthering the fragmentation and redundancy between IMSS and SSA. On the other hand, most of SSA's delegates were not able to participate in the complex coordination procedures at the state level and were thus not able to profit from the monies distributed through the COPLADES. Only the most developed states were able to benefit, turning the instruments of integral rural development into a regressive mechanism.

Health service decentralization in the 1980s

The government of Miguel de la Madrid came to power in 1982 at the beginning of the deepest recession in the history of modern Mexico. Between the end of the oil boom in 1982 and the last year of de la Madrid's administration the per capita health budget was thus reduced by 48.00/0. These cuts particularly affected the insured population which increased from 44.6% of the national population in 1982 to 52.1 % in 1987. This group saw its per capita health expenditures reduced by 15.7% per annum between 1983 and 1987, while the open population budget remained about constant. In all, the per capita health budget differential between the two groups was reduced from 3.62 to 1.39. This trend was to constitute an important obstacle towards

the policies of sectorization and decentralization pursued by the new Ministry of Health.

President de la Madrid used Mexican constitutional federalism as a ready-made charter for deep political reform, positing devolution, deconcentration and fiscal reform as the chief strategies to strengthen the basic units of government (Beltran and Portilla 1986). All this was to be more firmly coordinated by the minister of planning and budgeting, who was also supposed to devolve authority to the governors to coordinate the state-level field offices created in the previous administration. The state government's development plans were thus incorporated for the first time into an overall scheme, enabling a massing of financial resources to meet the economic crisis.

In his role as the previous minister for planning budgeting, de la Madrid had become preoccupied with the incapacity to provide good quality governmental health services within a well co-ordinated scheme, and recognized that a root cause of the problem was the accretion of various institutions into an unmanageable health sector. He created a health services coordination group to study alternatives for a national health system capable of reaching the 14 million then considered to be without any services, in order to achieve universal coverage. The main recommendations of the group were to couple sectorization and decentralization to achieve a strong health authority capable of transforming vices accumulated after decades of centralized fragmentation (Soberón 1987).

Those threatened by sectorization tried to thwart any attempts towards integration, and before the policy recommendations were adopted the leader of the Confederation of Mexican Workers forced through a mild definition of 'integration' with a formula of programmatic co-ordination which would guarantee the autonomy of IMSS. Furthermore, the social security institute proposed lessening fragmentation through a fusion of all federally funded rural health services around IMSS's own, more efficient and qualitatively superior social solidarity infrastructure. This motion was questioned by the group, arguing that it would deepen the urban-rural duality.

Conscious of the formidable obstacles to bring about reform at the central level, the health services coordination group established planning agreements with 20 state governors through the state-level planning bodies. These agreements enabled the analysts to obtain information, ideas and support for sectoral integration at the source of the problems and beyond the centralist sources of power of the national institutions. Fragmentation at the centre was thus combated with decentralization at the periphery.

President elect de la Madrid adopted the proposal of the health services coordination group and prepared a national health law and a constitutional amendment to establish health as a universal right. The new charters were a means to legitimate the role of SSA as sectoral head pave the way to the establishment of the national health system. However, this situation threatened IMSS, as the institute would lose power over its prestigious social solidarity programme, thus opening the door for redistributory demands such as had occurred in the early 1970s.

To avoid losing power and autonomy, IMSS acted early in the administration to comply with the philosophy of sectorization and decentralization under its own schemes. IMSS thus implemented its own deconcentration plans through widening the participation of its state-level Social Solidarity Boards to the Ministry of Health and other federal agencies. This channelled the drive towards decentralization away from fusion and devolution and towards more technical, paternalistic and counselling participation of the federal government within its social solidarity programme. IMSS also vehemently argued that SSA would not be capable of managing the social solidarity infrastructure, and that the final result of integrative decentralization was bound to be negative.

Facing strong opposition against both sectorization and decentralization, SSA set about formulating pilot projects for devolution, as well as streamlining its organic structure to play the role as normative head of the health sector. As a preliminary step to fully fledged decentralization, SSA deconcentrated all its field offices by giving them greater managerial responsibilities, such as planning and budgeting.

By 1984 many rival approaches towards decentralization had been formulated both by SSA and IMSS, thus threatening inaction. This led to a presidential decree stating for the first time, and thus compelling, the fusion of the social solidarity programme with services provided by SSA to create new organisms under the authority of the state governments and the normative control of the ministry (Diario OficiaI1984). Yet only 14 states reached such a stage by the end of the administration, I accounting in all for approximately 40% of the non-insured population residing outside the Federal District (which did not decentralize) and which had 45% of the health resources (Dirección General de Evaluación 1987).

Some of the factors that played a part in the decision to decentralize complied with the dynamics of interinstitutional rivalry. Indeed, the most outstanding fact behind implementation was that most of the devolved states were

also those with the least social solidarity infrastructure. This meant that IMSS was able to maintain 72% of it health centres and retain coverage of 6.5 million people. Implementation of decentralization was also favoured in states that had already achieve, greater financial decentralization for diverse historical reasons. Thus, prior to implementation the states chosen contributed an average of 17.43% of health expenditures, while those that were to remain centralized gave only 5.58% Basically, the Ministry aimed to decentralize those states where least resistance was met from both the social security institute and the local governors.

As well as the influences analysed above, the implementation of decentralization also had a direct relationship to centralist political control, and an inverse relationship to the pull of local or regional opposition forces. This was clearly demonstrated with the comparable states of Oaxaca and Guerrero. Oaxaca was the first state scheduled for decentralization, yet the decision was aborted in its early stages. The decision to try for early decentralization was an attempt that failed -to use the strategy to co-opt a statewide autonomist movement which was getting out of control after years of localized ferment (Rubin 1987). Health service decentralization seemed to promise the governor both the flexibility to handle resources according to his political needs, whilst giving him the image of autonomy required to co-opt those groups which questioned centralist dominance. However, as the conflict escalated, the strong and well-tried centralist muscle was used to quell the conflicts, while decentralization came to be seen by SSA as more of a risk than an asset.

The decision to abort decentralization in Oaxaca was welcomed by IMSS, as the institute stood to lose the greatest concentration of clinics in the social solidarity programme. Those in the Ministry of Health also sighed with relief at this decision, as they perceived the great complexities involved in decentralizing services that catered for a highly dispersed, unconsulted ethnic population. All this indicates that decentralization was not perceived to be the best medicine for Oaxaca, a very underdeveloped state.

Although Guerrero shared the same socioeconomic indicators and a similar number of social solidarity units as Oaxaca, decentralization was perceived there as highly plausible. Significantly, both the health minister and his planning under-secretary were natives of this state and strong candidates for becoming governor, a post finally assumed by the latter shortly after the implementation of decentralization. This evidence points to the highly centralist nature of the policy of decentralization, in spite of the official reference to the 'political will' of governors as the driving force behind policy implementation.

The interruption of the implementation of decentralization and its with holdment from 14 states, can be partlyoexplained as the result of pressures from IMSS to maintain the solidarity programme under its control, although the deepening of the economic crisis in 1985, and the incapacity to provide the needed incentives, also played their part. The decision to interrupt decentralization occurred when IMSS complained of the deterioration of services in the rural areas of the state of Guerrero -the state with the greatest number of social solidarity clinics that the institute had lost. IMSS seized on the opportunity to press their claim for interruption by going directly to the president, who then ordered an immediate evaluation. IMSS was able to convince the highest authorities that the changes in service indicators were the direct result of the new state health authority's incapacity to cope with decentralization, a view reaffirmed by the rather localized popular protest that also emerged. The president thus ordered decentralization to stop until both the Ministry of Health and IMSS jointly submitted a detailed evaluation that could lead to a remedy to the problems. Meanwhile, the services in the decentralized states were to be consolidated, while the remainder would pursue further programmatic co-ordination to avoid deterioration following decentralization.

The results of decentralization

Implementation of decentralization is still an ongoing process, and discussing its outcomes in health is premature. However, the structural change that occurred affected the delivery of services in ways that may well get misconstrued in final 'analyses. We will therefore focus on selected variables as indicators of the structural and processual changes attributable to decentralization. To this end a methodology was adopted that allowed comparison of decentralized and centralized states within a given socioeconomic region of the country, a possibility that resulted from the policy interruption discussed above. Through such a comparison the effects of the economic crisis could be separated from those attributable to decentralization.

The socio-economic region chosen was the poorest in the country. It contains the decentralized state of Guerrero and the centralized state of Oaxaca.[2] This region tests the adequacy of and obstacles against decentralized

health planning and management in a particularly poor and underdeveloped region. It has been argued that under these conditions decentralization is especially important in order to guarantee that health services are congruent with specific cultural and material realilies (Rondinelli el al. 1984). On the other hand, il has been pointed out that under these conditions local services are more likely to be prey to traditionalist and authoritarian local interests while the necessary administrative expertise may also be lacking (Rondinelli and Cheema 1983).

The health institutions and programmes in the two states chosen for the case study were polarized along the axes of political and administrative decentralization. Oaxaca's social solidarity programme not only remained under central administrative command, but became even more centralized as officials grew weary of the early efforts towards decentralization and programme extinction. On the other hand, and in spite of the abortion of devolution the state government had its local health law passed by the legislature, enabling the governor to name a minister of health. This he did by naming the federal delegate thus gaining some power over the federal health service machinery to implement his own health policy. This situation in Oaxaca resulted in mild administrative deconcentration of SSA, yet a more clearly defined charter for political decentralization.

On its own part, Guerrero had a strong, centralist political muscle acting in favour of decentralization, a situation that favoured the establishment of a state health ministry. Decentralization even went to the municipal level and Guerrero became the only state in the country to sign agreements with most of its municipalities.

Political devolution

Devolution has been termed the type of decentralization that confers or gives back political authority to a lower governing unit (Rondinelli and Cheema 1983). Decentralization in Mexico was posited as this type of transfer, going beyond the deconcentration previously attempted. Devolutionary intentions did promote a new, albeit limited, relationship between the state health services, state governments and ministry of health.

The state health services were created under a variety of forms, mostly pre-designed at the centre to comply with general norms and requirements. The options were ministries of health as part of the executive branch, departments of health dependent on a ministry of wider scope, or parastatal organizations such as institutes of health. Governors and local legislators could choose from these three options in order to adopt the organization that most suited their policies and styles of government.

The state of Guerrero first adopted the model of a state ministry, much resembling the federal paradigm. However, with the change of governor a further decentralized, parastatal organism was created, the health service directorate, with its own semi-autonomous governing council. This body pretended to avoid the bureaucracy of the state machinery and to establish a more congruous relationship with the centre, given that all employees remained outside the state's civil servants' charters.

Freedom to institute changes at the state level created problems for those in the federal ministry, as they had little control on who remained in charge, and felt that the human resources they had trained were being wasted. Furthermore, all administrative and technical were now open for state-level political negotiations, a situation which led in Guerrero to the coexistence of two rival teams, one in control of the governing council, the other of the directorship of services. Such a duality and job insecurity created a great deal of disorganization, and limited the capacity of middle-level functionaries to plan and face problems with autonomy. Furthermore, these people had no ties with local-level politics and felt threatened and alienated from the federal context in which, up to then, they had moved freely. With time, this situation led to greater central control, aided by influencing the appointment of a services' director from the ranks of the federation.

In Oaxaca, the duality between state and federal politics was also apparent, yet there it had a more positive balance. The naming of the federal delegate as state minister of health led to quite visible tensions between the demands made by the state authorities and those coming from the federation. As in Guerrero, the middle-level employees were more identified with the federation and none of them had strong local political ties. They thus resented the governor's interference in the services, a situation that was perceived as a severe distraction of the federal delegate from day-to-day managerial responsibilities, with too many public appearances with the governor. Furthermore, the governor channelled popular pressure to the federal services without having the corresponding federal backing of resources. In spite of these grievances, the power duality had some positive results, namely greater involvement of federal services in state politics and thus greater co-ordination with local problems.

Financial delegation

Two constant factors set a common pattern between decentralized and centralized health service organizations: the continuation of separate federal and state sources of finance -without the state meddling with the federal funds; and the maintenance of the federal labour relationship with all 'state' health workers -right up to the director or minister of health. Thus, all decentralized state health services, whether called ministries, departments or institutes became from the point of view of finance and control *de facto*, parastatal organisms of both the state and the federal governments.

All state health services obtained direct grants or 'subsidies' from both the federation and the state governments. The federal grant was allotted through monthly payments and distributed by the state authorities according to a previously approved programme budget. This gave state health services a degree of autonomy over expenditures, yet the state government's power was clearly limited given the centre's influence on programming and the inaccessibility of the state treasury to the funds.

Direct grants were justified by federal authorities as a means of avoiding both its own and the state government's bureaucracy, and thus increasing the effectiveness of implementing national policies through local field offices. Decentralization was more a measure to increase central control than a democratic principle or a response to political pressure from below. Financial control by the federation thus offset the governor's greater power to appoint functionaries and the insertion of state health services within local politics.

The state governments did not press for financial devolution either, as this would have implied greater responsibility than they could cope with. In spite of fiscal and administrative reforms to strengthen local governments' revenues, their share of federal fiscal appropriations was still meagre and awkward in its application, whilst their own tax bases were also weak. Assuming the financing of health through such a fiscal mechanism or through direct grants to the state treasury was tantamount to accepting *de facto* most of the financial burden.

Control over the financing mechanism enabled the federal government to allocate funds through channels and organisms isolated from other statelevel legislative and executive politics. However, the federation now bestowed on the states the legal and political responsibilities for their population's health. Local governments -right down to the municipality -were also becoming liable to the demands from individuals, municipal authorities, occupational associations and the federal government.

The new responsibilities of the states' governments started to change the political relationship with the centre: from being passive recipients of demands for collaboration, and evading them with equal ease, now they started to demand resources from the federation on the basis of state health plans submitted to the vote and the local legislator's evaluation. On the other hand, richer states -such as Tabasco or Jalisco -started to pour more monies out of their own tax funds, thus shouldering the impact of the crisis. These new political responsibilities were officially channelled through the National Health Board, where the decentralized state health authorities sat with the federal minister of health to exchange points of view over finance and control.

In spite of their greater political responsibilities, the decentralized states did not show greater local government involvement in finance than those states which remained centralized, even though all of them increased their financial burden as the economic crisis progressed. It was the still centralized states which showed greater financial decentralization, a situation congruent with our view that what occurred in the decentralized states was in fact federal financial delegation. It was noted above that the policy of decentralization was adopted giving preference to those states with greater financial autonomy, where on average the state governments contributed 17.43% of health expenditures, while those that were to remain centralized gave only 5.58"70. Yet, as the economic crisis proceeded, the centralized states doubled their share of the financial burden, whilst the decentralized states only increased theirs by 66%.

Personnel deconcentration

All state health services employees, from the janitors to the minister or director, remained within the federal payroll and labour relationship. This situation came about mainly because of the unwillingness of federal authorities to challenge the power of the corporatist trade union structure that characterizes labour relationships with the federal government. It was felt that the workers' trade union rights should not be harmed if decentralization were to proceed. On the other hand, no state governor was likely to accept more burdens into his or her payroll structure; and, more importantly, they could not offer the necessary incentives to deal with such a complex bureaucracy.

The federal government provided good incentives to bring about the transfer of social solidarity workers onto the ministry's payroll. All the latter's salaries were levelled for this purpose to those offered by the social security institute, and more workers were tenured. The offer of better working conditions and recognition of ladderranked privileges led to the transference of 93% of the 3969 social solidarity workers in the integrated states. Notwithstanding these precautions, labour conflicts did arise with decentralization: key social solidarity medical personnel were offered tenure within IMSS, thus leading to sudden resource shortages and a sharp downturn of basic hospital services. The major labour conflict related to decentralization arose with the 'horizontalization' of the malaria vertical campaign that had been in existence since 1956.

Personnel decentralization was limited to deconcentration of managerial authority of all labour relationships. All high-level decisions, such as the establishment of wage levels, were reserved for federal negotiation with the representatives of the still national trade union. However, the devolutionary context increased the scope and power of deconcentrated personnel decisions. The federal government 'invited' the state governors to be more concerned with 'their' workers' problems and to consider them as part of their political constituency. In this way, high-ranking state health services' officials received economic incentives from the state government, added to their federal salaries. Other forms of involvement were also encouraged, such as the state government's scrutiny over the professional behaviour of the workers, and the curbing of corruption.

The federal labour statutes had always been negotiated from a centralist perspective, making them particularly unsuitable for coping with the territorial framework that a decentralized system requires to deliver services according to local needs. These problems were highlighted when the malaria health workers remained in urban areas and avoided efforts towards better territorial integration.

Sectoral and regional coordination

The ministry of health aimed to reinforce the participation of the health sector within the COPLADES, under the coordination of the state minister of health or, in still-centralized states, of the federal delegate. The COPLADES were chosen as the most efficient way of linking resources to the priorities set through the state plans, with the participation of representatives of the whole health sector and the authorities at the federal, state and municipal levels (Soberon 1987).

One of the first concerns of ministry officials was to train the delegates so that they could formulate the CUD funding agreements promoted by the Ministry of Finance and Budgeting through the COPLADES. Ministry officials argued that lack of training was promoting a vicious circle of underdevelopment, where only those most highly trained delegates in developed states were able to ask for and utilize federal monies channelled through the COPLADE. Once properly trained, the delegates, or new state ministers of health, would coordinate the formulation of state health plans by the local sectoral authorities.

In spite of the efforts towards decentralized sectoral integration, this became a difficult or even impossible task in both Guerrero and Oaxaca given the strong traditions of independent and centralized planning -much promoted by the vertical and autonomous implementation of the social solidarity programme during the oil boom. In the early stages of sectoral coordination in Oaxaca, conflicts arose as IMSS claimed to be covering all the non-insured population through social solidarity, thus threatening more than 200 ministry clinics with obsolescence. When talks broke down between the two institutions, the delegated ministry's planning officer simply wrote into the plan what he thought could be each institutions's coverage. The state health plan was thus the product of the ministry in Oaxaca, complying with a blueprint supplied from the centre. By contrast, in Guerrero, the health sector as a whole had greater participation in the formulation of the health plan, albeit with a visible dominance by the ministry officials.

The establishment of the new, integrated and decentralized health service administration in Guerrero led to an emphasis on sectoral planning and financial decentralization, while little attention was paid to regional coordination amongst other social policy agencies. The regional ranches of the COP LADE met only sporadically and with very poor attendance. The pattern of negotiation with the population was vertical, and little breath was wasted when denying the municipal presidents' petitions for new health centres despite their offer to shoulder construction costs. On the other hand, the decentralized administration made great efforts to establish decentralization agreements with most of the 70 municipal governments, sparing only around 15 of the poorest. Such agreements produced a great deal of conflict when several municipalities challenged the state authorities' failure to recognize past financial agreements and felt they were being overburdened with responsibilities. By contrast, the economically important municipality of Acapulco enjoyed direct

financial agreements and support from the federation, bypassing any state-level negotiations. Thus, while the poor municipalities became truly decentralized financially, the rich ones became, in fact, further centralized.

Performance of the COPLADE in Oaxaca showed a marked contrast to the one in Guerrero. Once sectoral collaboration became impossible due to the rift between IMSS and ministry officials, the COPLADE was taken over by the state government as a means of gaining control of the highly dispersed population. The eight regional planning sub-committees throughout the state became markedly active from 1984, with an intense participation by Ministry of Health delegates at the jurisdictional level. A great variety of health or health-related topics were discussed, ranging from collaboration for epidemic control, nutrition, drinking water, electricity and drug supplies. In contrast, no delegates of the more important social solidarity programme were involved in these meetings.

The impact of decentralization on equity

Decentralization was often defined by health officials and politicians as a democratizing and redistributive policy, linked to the electoral promise of striving towards a more equitable society. The consequences of decentralization for service distribution were thus expected to favour their more equitable response to health needs. [3] To examine this proposition we defined equity as the situation where all population groups have equal probability of satisfying their health needs, and did not rely on the definition of simply the equal distribution of services (Musgrove 1983). To assess health needs an indirect approach was used, given the absence of reliable morbidity and mortality data. Census statistics at the municipal level were used to indicate risk factors for the prevalence of infectious diseases and infant mortality.[4] These variables were processed using principal component analysis to stratify the municipalities or districts in Guerrero and Oaxaca into five groups (Table I).

Official non-insured health service statistics were used to indicate health need satisfaction.' The in dicators chosen were general consultations; extension of service coverage, measured through first time consultations; protection against pertussis, tetanus and diphtheria, measured through the application of the third dose of DPT vaccinetion; and antenatal care enrolment, measured through first-time antenatal consultations.[6] The analysis assessed the per capita distribution of each variable among the non-insured at the municipal level. DPT vaccination considered only children under 4 years of age, while antenatal care considered only pregnant women between 12 and 50 years of age. [7]

Variables were collected for the years 1985-87. 1985 provided the base line to measure the impact of decentralization in Guerrero.[8] 1986 and 1987 showed the trend of variables after decentralization in Guerrero, and the historical trend and control for the effects of the economic crisis in Oaxaca. To measure overall impact the two year trend was averaged.

In the state of Guerrero as a whole three variables increased following decentralization, while only one decreased (Table I). This contrasts with a lowering of all variables except one during the same time period in the still-centralized state of Oaxaca. Increases in Guerrero were particularly marked for total and antenatal consultations, with 44.3% and 59.7%, respectively. Initial consultations increased only at the same rate as total population increments. This means that services were received by the same population, with little, if any, extension of coverage. Those that already received services in 1985 thus benefited with an increment in their consumption. DPT vaccination decreased in Guerrero by 15% showing, again, a deficiency in service outreach. Increments in Guerrero can be accounted for by the policy of favouring the decenatralizing states with added resources as a means of motivating this change.

Pregnancy care enrolment was the only indicator that showed an increment in Oaxaca during the period studied, with an increase of 17.5%. Cuts in this state particularly affected total consultations and DPT vaccinations, with a drop of 27.3% and 23.2%, respectively. First-time general consultations dropped by 9.2%. This pattern can be accounted for by the affects of the economic crisis, leading to shortages of resources ±such as DPT vaccine- within health services and to an increment in economic obstacles between the services and the population, lowering accessibility.

Prior to decentralization, the pattern of distribution of health service indicators between the different strata of the non-insured population in both Guerrero and Oaxaca tended to be equitable(Table 1, Figures 1 and 2). Preventive services such as antenatal care and DPT vaccination showed a similar distribution across socio-economic groups, showing that services were being delivered through a principle of equality. General and first-time consultations showed a pattern of equity, since the most needy also received significantly more consultations per capita, although in some case the more affluent also received more care than the middle groups. It can also be

Table 1. Non-insured population and some per capita health service indicators in the socio-economic strata of Guerrero before and after decentralization, and in Oaxaca, 1985 and 1986/87.

	Strata	Non-Insured In 1985		General first-time consultations			Total general consultations			First-time pregnancy consultations			Complete DPT vaccinations		
			%	Before	After	%	Before	After	%	Before	After	%	Before	After	%
Oaxaca	1	157 644	7	0.49	0.32	-34.9	0.12	0.07	-4.2	0.78	1.22	57.6	0.10	0.06	-38.6
	2	596 499	26	0.29	0.30	1.6	0.12	0.11	-12.4	0.73	1.07	46.2	0.15	0.10	-30.6
	3	1 315 969	56	0.31	0.29	-5.0	0.49	0.37	-24.5	0.88	0.90	2.6	0.17	0.14	-19.8
	4	227 421	10	0.30	0.25	-16.6	0.77	0.50	-35.6	0.61	0.58	-6.0	0.26	0.19	-27.6
	5	40 986	2	0.48	0.38	-21.0	0.59	0.56	-4.4	0.58	0.84	45.3	0.18	0.13	-28.4
	TOTAL	2 338 519	100	0.32	0.29	-9.2	0.40	0.29	-27.3	0.80	0.94	17.5	0.17	0.13	-23.2
Guerrero	1	289 909	18	0.29	0.46	58	0.19	0.69	257	0.38	1.26	230	0.19	0.22	18.6
	2	123 809	8	0.15	0.26	77	0.11	0.39	259	0.29	0.95	220	0.19	0.20	5.2
	3	1 056 031	66	0.25	0.22	-12.0	0.30	0.32	7.4	0.63	0.76	20.7	0.20	0.17	-16.5
	4	109 232	7	0.35	0.25	-29.4	0.44	0.34	-20.9	0.44	0.38	-14.0	0.17	0.08	-52.9
	5	17 034	1	0.22	0.11	-50.0	0.25	0.14	-46.5	0.21	0.12	-43.5	0.14	0.00	-97.9
	TOTAL	1 596 015	100	0.26	0.27	4.7	0.28	0.40	44.3	0.72	1.15	59.7	0.20	0.17	-15.0

Before = 198; After = Average of 1986 and 1987.
Source: Secretaría de Salud, Servicios Estatales del Estado de Guerrero; IMSS, Programa IMSS-COPLAMAR.
Denominators: First and total consultations, all the non-insured population; pregnancy care, pregnant women between 12 and 50 years of age; DPT, children under 5 years.

seen that most of the indicators are higher per capita in Oaxaca than in Guerrero.

The similarity in the pattern of distribution of service indicators between the two states demonstrates the identity of administrative system and the similarity in socio-economic conditions before decentralization. How did the pattern of distribution change once Guerrero became decentralized? How did the economic crisis affect both states, and to what extent was decentralization a protective policy against resource and purchasing power cuts among the health services and the population?

Oaxaca continued distributing services in 1986 on 1987 with a similar overall pattern as before, albeit with an important decrease in volume across all indicators (Table 1, Figures 1 and 3). General consultations changed from an equitable to an inequitable pattern, while health service extension decreases were more marked for the best stratum. The negative effects of the economic crisis along the five strata were thus assimilated with equality in the state that remained centralized.

After decentralization in Guerrero a significant change occurred in the pattern of distribution of services between strata (Table I, Figures 2 and 3). The best two strata were the only ones that benefited by the increments, while the middle´ strata, where 660/0 of the population were placed, experienced little change either way. The two poorest strata experienced important decreases in all services. The most drastic changes were the increments in the initial antenatal and total consultations in the best strata -in the order of 220-260% -and the interruption of DPT vaccination for the poorest group.

Decentralization thus implied an 180 degree change in the policy of service distribution, from a pattern of equity to one of inequity. It is remarkable that, in spite of the economic crisis, the state as a whole received more services, yet all of the increments went to benefit the most

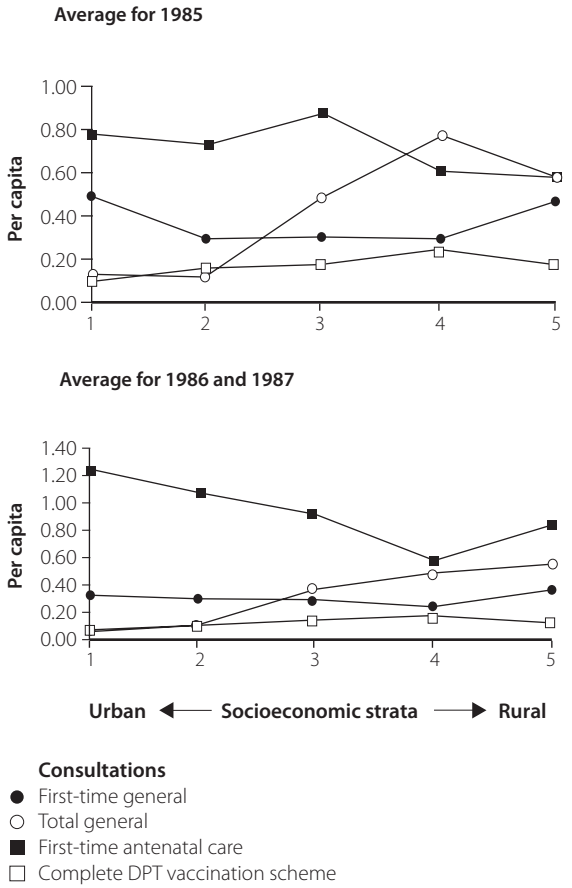

Figure 1. Per capita health service utilization by the different socio-economic strata of the non-insured population of Oaxaca, according to selected indicators and different periods of the economic crisis.

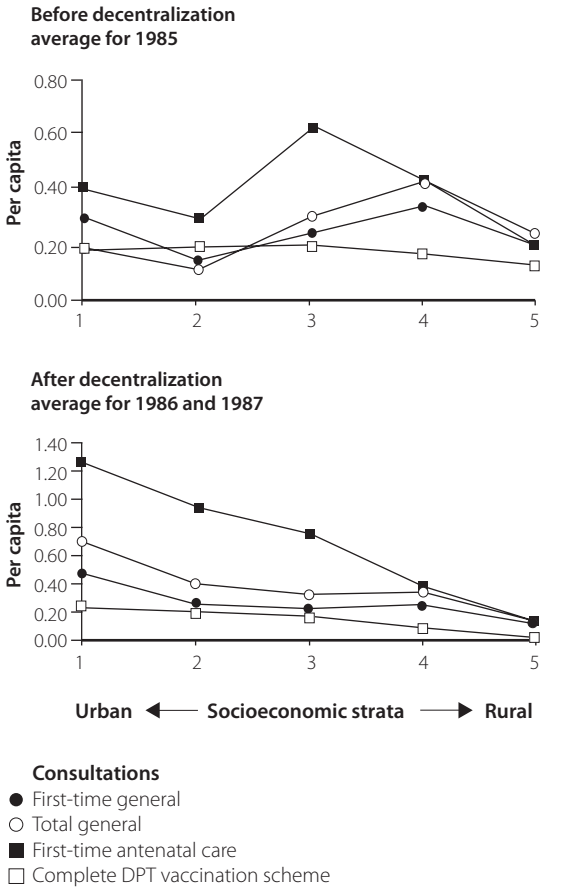

Figure 2. Per capita health service utilization by the different socio-economic strata of the non-insured population of Guerrero according to select indicators, before and after decentralization.

important cities of the state. Approximately 8% of the population -those in the lower two strata -suffered a significant drop in services; these people were mainly indians and peasants living in the small and dispersed settlements with a regional or subsistence economy.

The change to an inequitable service distribution pattern can be accounted for by the policies followed in planning and resource allocation. The tourist resorts of Guerrero received through municipal decentralization -added resources directly from the federation, bypassing the state-level negotiations. The municipalities in stratum 3, on the contrary, were saddled with added financial burdens and left to negotiate on a bilateral basis with the state-level authorities. The poorest strata signed no decentralization agreements and continued having a centralized relationship, yet now more focused on the state level authorities.

The maintenance of the equitable or egalitarian pattern of service distribution in Oaxaca through the economic crisis can be explained as the result of a lack of prioritization of resource assignments for key regions of the state. It seems that the politically motivated persistence of the dual health service infrastructure and the resistance to decentralization led to an emphasis of the status quo. The comparison between the two states shows that the incentives that were offered by the central authorities to decentralize were better assimilated by the richer and economically more strategic municipalities, thus turning decentralization into a distributive policy capable of stimulating further growth.

Decentralization was clearly associated with important increases in service utilization in the urban areas. However,

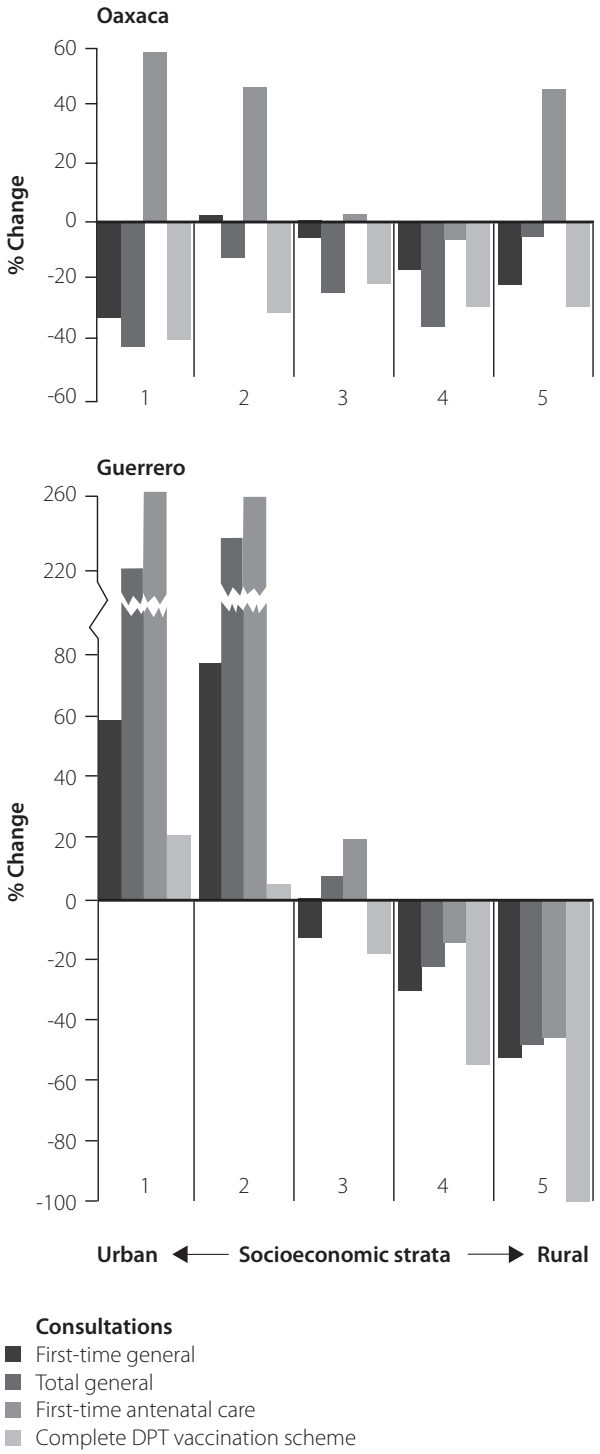

Figure 3. Percentage changes in the utilization of selected health service indicators in the socio-economic strata of the non-insured population of Oaxaca and Guerrero, 1985 and average of 1986-87.

its association with the lowering of services is more problematic, given the parallel effects of the economic crisis. The lowering in health service utilization indicators among the two poorest strata was significantly greater in Guerrero than in Oaxaca (Figure 3). Here it would seem that the interinstitutional conflicts around the implementation process were responsible for the excessive drop that was greater than would have been caused by the economic crisis alone. We emphasize the negative consequences of conflicts at the central level, rather than the benefits of decentralization itself. Indeed, given the utter poverty in most of the municipalities of the lower two strata, no decentralization agreements were signed. It can be said that decentralization there had more of a 'rebound' effect, rather than a direct impact on planning, finance and operation.

In contrast to the picture seen in the lower two strata, Guerrero did better for stratum 3 than Oaxaca, with only a small fall in two indicators and a similar increment in another two (Figure 3). This is significant because stratum 3 is where 66% of Guerrero's population and 56% of Oaxaca's were concentrated. The decentralization agreements signed in the mostly rural, stratum 3, municipalities of Guerrero seem to have lent some protection to service utilization against the economic crisis, perhaps through making health services accountable at the local level. This was in spite of the conflicts observed between the state authorities and some municipalities. Given the importance of stratum 3, it can be said that decentralization as a policy structure showed a nett positive effect in the more prosperous rural areas of Guerrero, in contrast to the nett negative effect due to the implementation process in the poorest rural areas.

Conclusions

We have analysed decentralization as a complex multifaceted policy, determined in its benefits by the centralist, institutional and political interests affected. We have also questioned the policy's capacity to generate and integrate services in specific development areas. Analysis at the central level revealed that, after decades of centralization and fragmentation, the policy was received with distrust by IMSS, as it threatened its hegemony over Mexican health policy. The rivalry for leadership, resources and legitimation at the centre -quite apart from real problems encountered during implementation -undermined the expected benefits and led io an interruption of decentralization.

The study undertaken at the state level showed that the centre-local relationships in health care for the non-

insured were only partially devolved. The state and municipal governments acquired greater political responsibility for health care, yet service administration, particularly the control of finance and personnel, were actually reconcentrated by the federal power along more integrated and less bureaucratized lines of command. This enabled greater capacity to channel local, and particularly federal, resources to the key economic enclaves within the most underdeveloped region of Mexico. In contrast, the majority of the population living in poorer, rural areas continued experiencing the brunt of the economic crisis, receiving few benefits from decentralization. The poorest, indigenous and highly dispersed populations actually lost services as the result of the centralist conflicts that hindered coordination during implementation, a situation probably made worse in the context of the economic crisis.

The political and public health results of decentralization in Guerrero point to the amplification of the health differentials between the rural and the urban areas, and between those sectors of the economy engaged in the regional and national produce markets, and those generating foreign exchange through tourist services. Decentralization thus became a distributory policy closely allied to the industrial modernization and export promotion policies that were being followed in the economic sector. The policy thus pointed towards an alternative to the much-criticized corporatist arrangements of which IMSS is a vital part. Therein may lie an explanation of the institute's staunch defence of its centralist, social solidarity programme.

Despite the vigour of the new policy, centralism actually prevailed as IMSS was able to keep most of the social solidarity programme by pressing for policy interruption, and even policy reversal. With the new administration of Salinas de Gortari, IMSS is receiving renewed support to channel the benefits of the promised economic growth to the rural areas. The proposal is not only to revamp the social solidarity programme, but to merge under it all the ministry's rural infrastructure, whilst keeping the successful urban areas decentralized.

The proposal is being justified by pointing out the negative results observed in Guerrero´s rural areas, blaming them entirely on the failure of decentralized institutions, rather than on the implementation process or, more importantly, on the economic crisis. Once these two missing processes are accounted for, we can see that the policy alternative in question would lead towards greater regional polarization if economic recovery does not happen soon. Indeed, the rural areas would continue to suffer the downward trend observed for Oaxaca, whilst the urban areas would be likely to continue improving their own standards, as in Guerrero. This would be even more emphasized when the two health infrastructures are formally separated between state-level and federal-level authorities, diminishing the accessibility of the rural population to the urban-based hospitals.

If economic recovery does come soon ±an unlikely prospect to many- integration of all rural services under IMSS would be an interesting prospect, despite its initial divisive effects. It represents a route towards the integration of a national health service, perhaps even a speedier route given that it would create a highly polarized and unstable situation. Indeed, IMSS would be responsible for the two extremes of the Mexican working class, the impoverished peasants and the highly privileged urban and industrial workers. The state's health authorities would be left with the responsibility for the urban un-and underemployed, a population which would not warrant the ample hospital infrastructure that the Ministry of Health has built over the years. The chances of fusing all federally funded health services under IMSS would thus be greater.

Re-centralization of all the rural, non-insured health services would in itself press for greater access to the mainstream services enjoyed by the insured, as the social solidarity programme would become more the object of public attention and of the ministry's control. However, it is unlikely that this path will be favoured by IMSS. On the contrary, the argument followed here is that IMSS has accepted increasing responsibilities for the non-insured as a contractor for the federal government only in so far as this gives the industrial, corporativist interests more negotiating power in society.

The policy alternative sustained by the weakened the weakened Ministry of Health is to carry on with decentralization, to encourage regional integration and efficiency in the services for the non-insured, together with the promotion of state-level health systems through which the social security institutions and private medicine are coordinated. As the urban services are improved by decentralization greater potential for redistribution of benefits to the rural areas can be expected. However, decentralization does not seem to act favourably towards redistribution, as the benefits observed in the urban areas were obtained to a large extent thanks to the more autonomous negotiations at the municipal level. Furthermore, state-level authorities have little capacity to press for regional redistribution, particularly through the integration

of the insured and non-insured services.

A third policy alternative currently being explored is the integration of all federally funded services under IMSS, while maintaining the decentralized health authorities which assume a clearly defined role in the supervision of the quality and equity of services provided by IMSS to the different sectors of the population. IMSS would thus become more of a service provider, whilst other institutions would assume the role of financiers, whether through tripartite or bipartite arrangements, or directly through tax and public debt funds. This alternative would give coherence to the responsibilities increasingly assumed and defended by IMSS, yet it would lead to greater equity and efficiency in health services.

There is no doubt as to the current crisis in Mexican public health institutions. Decentralization has played an ambiguous role to solve this crisis, as what have been benefits to some in fact represent liabilities to others. Which path is followed by decentralization in the future will very likely depend on the economic policies pursued, the play of centralist interests, and on the capacity of state-level authorities to assume a role in the political economy of health.

Endnotes

1. The 14 states that decentralized were Aguascalientes, Baja California SUR, Colima, Guanajuato, Guerrero, Jalisco. Mexico, Morelos, Nuevo Le6n. Quintana Roo, Queretero, Sonora, Tabasco, and Tlaxcala.
2. The region chosen contrasts with others in the country with more mestizo population better communications and urban population, greater per capita income and industrialization, all of which make Mexico a middle-income country. The south thus shares more the characteristics of the poorest countries in Latin America, especially those in Central America.
3. Only the public, federally funded institutions catering for the non-insured or 'open population' were analysed, as the social security institutions were not the object of the policy examined. It is thus assumed that there was correspondence between the institutions and the population served a situation which is generally true.
4. The census indicators used for the stratification were illiteracy rate, rate of non-Spanish speech, rate of non-primary school attendance in children from 6 to 12 years of age, sleeping room crowding, sewerage availability, agricultural activities, degree of urbanization, and relative size of the 0-4 age group.
5. Health variables were collected routinely at the health centre level and on a daily basis, Data were aggregated by the researchers. It is assumed that all health service data correspond to people living within the municipality (or district, in the case of Oaxaca) and thus sharing similar socio-economic status, This assumption seems warranted for the states chosen, given significant homogeneity within the municipalities and great dispersion, thus making geography an effective barrier for accessibility to the first level of care, The only major exception to these assumptions is the Municipality of Acapulco, Albeit it harbours a heterogeneous and large population, its relatively better position within the stratification (stratum 1 in Guerrero) is warranted for most of the population.
6. Health variables were selected using three criteria: they had to be important for the satisfaction of health needs, had to be reliable within the time periods considered, and their equity had to be susceptible to amelioration through decentralization, Only first-level clinic statistics were used, as hospital care, albeit important, was difficult to allocate to socio-economic groups with the officially available data.
7. The number of non-insured pregnant women was estimated using data from the state-level national health survey. It can be noted that the best strata in Guerrero and Oaxaca showed an indicator above 1 at some point. This is an anomaly, as it is not likely that on average pregnant women were being enrolled to pregnancy care more than once in each pregnancy. This can be explained as the result of utilization by insured pregnant women not included in the denominator.
8. It would have been ideal to collect information for at least five years prior to this period to assess past trends, However, such information was not available due to a change in the official collection system and the scrapping of old municipal level registers.

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Health transition in middle-income countries: new challenges for health care*

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Concepts behind current health systems are no longer adequate for dealing with the growing complexity of the health arena, both internationally and nationally. It is now too simplistic to classify world health in bipolar terms, such as East versus West, or North versus South. Conversely, epidemiologic differentiation *within* each country is now producing internal polarization: diminishing health care budgets may increase competition for scarce resources between two different groups of health problems -the left-over ills, caused mainly by common infectious diseases and malnutrition; and the emerging threats of chronic ailments, accidents, mental disorders, and now AIDS. In this situation, the former group is likely to lose out.

It is imperative to avoid this pernicious competition by developing new health care models that assume a population-based responsibility. Unless comprehensive and cost-effective solutions to the two groups of health problems are provided simultaneously we risk an unacceptable paradox: instead of being an instrument for equity, health services may serve to increase social inequality.

Introduction

The aftermath of the second world war led to an intense process of industrialization in most middle-income countries. Standards of living rose at a much faster rate than ever before, and new medical and sanitary technologies came into existence. As a result of these and other concomitant factors, the mortality rate declined impressively. Life expectancy of the Mexican population, for example, rose from 41 to 66 years during the period 1940-1985. Many children who previously would have died from infectious diseases survived, thereby increasing the number of people exposed to risk factors (which also increased) for chronic diseases. Nowadays, therefore, middle-income countries not only have to cope with the *left-over ills* of infectious diseases and malnutrition, but also with new calamities, such as cardiovascular diseases, cancer and accidents.

This paper aims to analyse the dynamics of the health changes that are taking place in middle income countries, which are in the midst of intensive economic and social transformations.

Justification for this type of analysis stems from the need to anticipate future requirements for the health system. This, in turn, will provide the basis for planning and shaping the health services to meet the complex and chaning health needs of populations.

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Some might question the need for the advance planning of health systems in middle-income countries: Why not simply continue to import the medical model already developed in high income countries? The answer is simple but not necessarily obvious. First, the medical model in most developed countries has been shown to be ineffective in coping with increasing demands partly because of the rising costs of medical technologies. Second, the epidemiologic transition in high-income countries occurred at a different rate and followed different patterns from that of middle-income countries.

Just as the classical epidemiologic transition of the industrialized Western nations cannot be assumed to be the model for underdeveloped countries, so we cannot the latter as a homogeneous group. In fact, it is our contention that catch-all categories, e.g., "underdeveloped" or "developing" countries, are becoming increasingly meaningless, at least as far as the health arena is concerned. In many respects, differences between the various groups of developing countries are as marked or even larger than comparisons with developed nations. For this reason we will not attempt here to make undue generalizations about the so-called developing countries. Until better classifications are agreed upon we will adopt the one used by the World Bank, which is based on national income percapita. Accordingly, we will limit our discussion to the groups of "middle-income" countries which, in 1984, had a median GNP per capita of $US 740 for lower middle-income countries, and of $US 1950 for upper middle-income nations.[1]

This paper is divided into three parts. First, we review the conceptual basis of the epidemiologic transition, proposing some corrections and additions that are relevant to a large number of middle-income countries. Next, we examine, as a case study, the epidemiologic transition in Mexico, based on the changes in mortality and morbidity during the past 45 years, but mostly forecasting those likely to occur in the next 12 years. Last, we list and describe some of the most relevant effects of the epidemiologic transition on the health system, with particular reference to Mexico.

Epidemiologic transition: new concepts for an old process

Demographers initially proposed the concept of 'transition' to describe the differences in demographic patterns between countries with dissimilar levels of social and economic development. The main emphasis was given to the sequence of decline, first of mortality rates and later of fertility rates: this explained the transformation of the population age structure from a pyramidal shape, with a wide base, to one that was column-shaped.

The original concept of epidemiologic transition was introduced by Omran in 1971,[2] although in 1969 Frederiksen had analysed the relationship between the economic transition, the demographic transition, and the concomitant changes in health and the organization of health services.[3] At about the same time and, it would seem, quite independently, Lerner wrote a paper on what he called the "health transition".[4]

The concept of epidemiologic transition refers to the series of interrelated and complex changes in the health and disease patterns that occur in specific human populations over large periods of time. These changes are usually closely related to the major economic, social and demographic transformations of societies. Normally they occur in a sequence that alters from a pattern dominated by infectious diseases -closely associated with the scarcity of essential goods such as foad, housing and education to one where chronic and degenerative ailments predominate.

Most of the theoretical frameworks on the epidemiologic transition posit a linear and unidirectional sequence. This suggests that all countries eventually pass through the same stages of the transition, and that in each stage there is one dominant pattern of morbidity and mortality. In his original formulation, Omran proposed three stages or eras:

- *The era of peslilence and lamine,* when mortality is very high and fluctuating, life expectancyat birth is around 20-40 years and there is no population growth.
- *The era of receding pandemias,* characterized by a reduction in the mortality peaks that were caused by large epidemics, alife expectancy at birth of 30-50 years, and a sustained demographic growth.
- *The era of the degeneralive and man-made diseases,* dominated by a sharper decline in mortality, alife expectancy at birth of over 50 years, and the emergence of fertility as the decisive determinant of demographic growth.[2]

Omran documented his concept of the epidemiologic transition with three different models:

- *The classical or Weslern model,* experienced mainly in Europe.

- *The acceleraled model,* represented by the Japanese experience.
- *The contemporary delayed model,* characteristic of the one followed by the present-day developing countries.

These models are mainly determined by the time of onset and period then taken to pass form one of the above eras to another. The progression, however, is always proposed to be linear.

Based on the evolving experience of many middle-income countries, we propose some modifications to the original theory, the most important of which are:

1. The eras are not necessarily sequential, since two or more may overlap.
2. The evolutionary changes in the patterns of morbidity are reversible, giving place to what could be called a *"counter transition"*
3. There is, in consequences, a new model of epidemiologic transition, typical of countries where the changes do not fully take place and where different types of diseases coexists in the same population; this we call a *protracted* epidemiologic transition. [5]
4. The coexistence of pre-and post-transitional diseases leads, in certain countries, to an *epidemiological polarization.* The old health inequalities among social classes, which hitherto were predominantly quantitative, become qualitative with this polarization. The poorer sector of the population would not only present with higher rates of disease, but these would be of different kinds, mostly either infections or nutritional disorders.

Finally, a note on the value judgements implicit in the labels traditionally given to morbidity patterns and groups of diseases. From the dominant discourse of health researchers and officials, there seems to be a notion that some diseases are socially more acceptable than others. The displacement of infections by accidents and chronic diseases is often referred to as a sign of progress. Some go to the extreme of designating the latter as the "ills of civilization". Actually, these health problems are a result of a defective process of industrialization that has given priority to economic growth over human welfare, as manifested by the new hazards of chemical pollution which now coexist with the perennial problem of biological contamination. Therefore, some of the labels are thoroughly wrong. If such diseases of civilization were to exist, they would be the infections which have, throughout history, been disseminated among human populations by cultural vectors,[6] such as commerce and migration.

Mexico as a prototype of a middle income country

Analysis of the epidemiologic changes in Mexico must include not only those that have happened in the recent past, but also those that are likely to occur as a result of the decline of fertility and the severe economic crisis that the country is experiencing.

Changes in the rate, age structure and causes of mortality

The crude mortality rate in Mexico started a steep decline at the beginning of this century, although most of the reductions occurred in the decades of the 40s and 50s. From a figure of 23.5 deaths per 1000 in 1940, the crude* mortality rate decreased to 6.2 in 1980, i.e., a reduction of about 75% (Table 1).

When the age-specific mortality rates are examined, it is clear that the greatest reductions in mortality have occurred among children under five. In contrast, the mortality rates among adults have remained constant and thus the relative contribution to the overall mortality rate of deaths from this group has risen. The infant mortality rate was around 323 per 1000 births in 1910, dropping to 96.2

Table I. Crude mortality rate and relative change in selected years, Mexico, 1900-1980

Year	Rate	Relative change
1900	33.6	-30
1920	23.52	+9
1930	25.6	-8
1940	23.5	-8
1950	16.0	-32
1960	11.2	-30
1970	9.6	-14
1975	7.2	-25
1980	6.2	-14

* Since the population age structure showed only slight changes during the period 1940-1980, the age-standardized mortality rate shows no difference when compared with the crude once.

in 1950 and further declining to about 35 deaths per 1000 in 1985. In other words, children today under one year old have ten times more chance of surviving than those born at the beginning of the century (figure 1).

In 1982 Bobadilla[7] pointed out that the epidemiologic transition in Mexico was quite different from the one experienced in developed countries. He reported that, in the decade of the 50s, the then main causes of death already included many chronic and degenerative diseases, such as heart conditions, tumours and cerebro vascular problems; this was at a time when infectious diseases caused more than 30% of all deaths. This is possibly the first description of the Mexican epidemiologic transition that was later to be described as "protracted" [5].

Analysis of mortality trends in the period 1950-1980 reveals three groups of causes of death: 8 first, the group infectious diseases that show a significant decline, most noticeably malaria, whooping cough and dysentery (figure 2,above); second, the chronic and degenerative diseases and the accidents, which show a sharp increase notably ischaemic heart disease, diabetes and motor vehicle accidents (Figure 2, below); and third, the remaining conditions, in cluding congenital malformations and perinatal problems, which show little change.

Table 2 show the ten main causes of death in the period 1955 ± 1957, and in 1980. The mixed pattern of diseases is again apparent from a comparison of the two periods. In 1955 ± 1957 almost 43% of the total deaths were due to gastroenteritis, influenza and pneumonia, and child hood diseases, whereas in 1980 only 17% of deaths were due to influenza and pneumonia together with enteritis and diarrhoeal diseases. Although the groups are not strictly comparable, the decline in the relative contribution of the infectious diseases is quite clear. In contrast, heart diseases, malignant tumours and accidents were responsible for only 14% of the deaths in the first period, increasing to almost 29% in 1980. [9,10]

Table 2 also shows the rate of these changes: infectious diseases declined to less than half from 1956 to 1980, while accidents almost doubled their rate. It is important to note the disappearance of malaria as a cause of death.

The epidemiologic polarization in Mexico is largely explained by the different pace of change in the causes of ill-health among the social classes. Health inequalities have roots in the ways in which population groups are established within the production system; these may be manifested in many dimensions geographical, institutional, political and certainly occupational. In Figure 3, the five main causes of death for the two main groups of health service users in the Mexican Institute of Social Security are shown. On the left of the figure, numbers refer to the insured population wich is employed and entitled to the full range of social security benefits, including health care; these are mainly manual workers. On the right the numbers refer to the inhabitants of rural communities who have geographical access to a subsystem of the health care of this institution; they are mainly agricultural workers, most of them not entiled to social security benefits. Comparison of the causes of death illustrates the epidemiologic polarization, since the former group present a mixed pattern of diseases while the latter show a pretransitional pattern.

On the other hand, "Certain causes of perinatal mortality" appear among the ten causes of death in 1980 show in Table 2. These deaths are mainly due to intrauterine

Figure 1. Age-specific mortality rates in Mexico, 1950-1980. Rate is per 100 000 inhabitants.

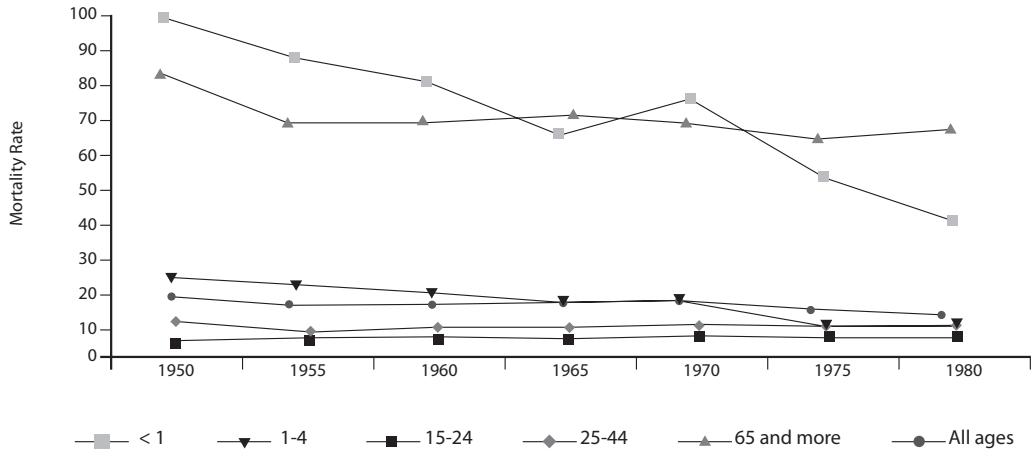


Figure 2. The main causes of death in Mexico that show a significant increase or decline between 1950 and 1980. Rate is per 100 000 inhabitants. ***Sourse;*** Dirección de Estadistica SPP.

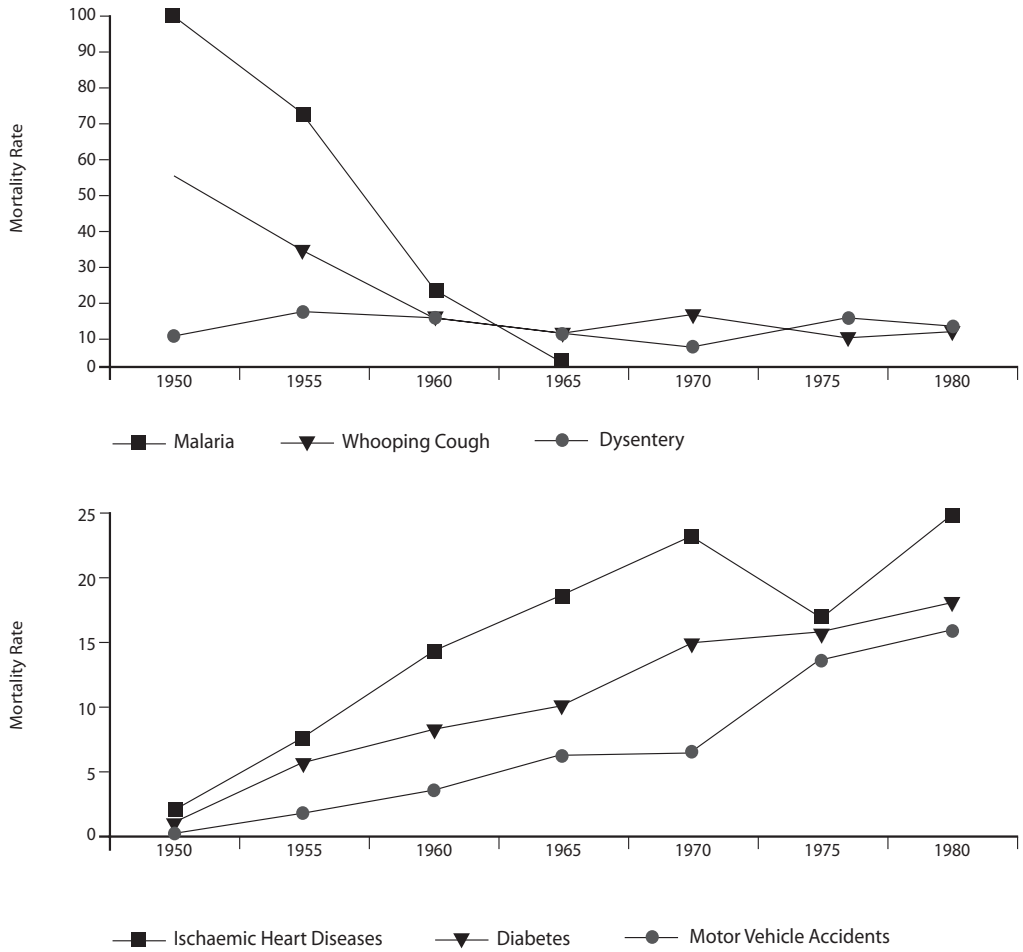


Table 2. Changes in the first ten causes of death in Mexico, 1955-1957 and 1980. Rate is per 100 000 inhabitants

1955 – 1957			1980		
Cause of death	**Rate**	**%**	**Cause of death**	**Rate**	**%**
Gastroenteritis	227.5	17.5	Heart diseases	74.9	11.6
Influenza and pneumonia	202.0	15.5	Accidents	71.1	11.0
Childhood diseases	135.3	10.4	Influenza and pneumonia	56.9	8.8
Heart diseases	91.4	7.1	Enteritis and other diarrhoeal diseases	55.1	8.6
Malaria	66.4	5.1	Malignant tumours	39.2	6.1
Accidents	48.1	3.8	Certain causes of perinatal mortality	39.2	6.0
Homicides	38.0	2.9	Cerebrovascular diseases	22.6	3.5
Malignant tumours	37.8	2.9	Cirrhosis other chronic diseases of the liver	22.1	3.4
Bronchitis	31.7	2.4	Diabetes mellitus	21.7	3.4
Tuberculosis, all forms	31.2	2.4	Nephritis, nephrosis	10.5	1.6
All other causes	390.0	30.0	All other causes	231.6	36.0
Total	1299.4	100%	Total	644.9	100%

Figure 3. Comparison of the relative distribution in 1981 of the five main causes of death in two population group users of the Mexican Institute of Social Security health services. On the left, the percentages refer to the insured workes (mainly manual) and their families; on the right, they refer to the rural, uninsured population (mainly agricultural woekers.

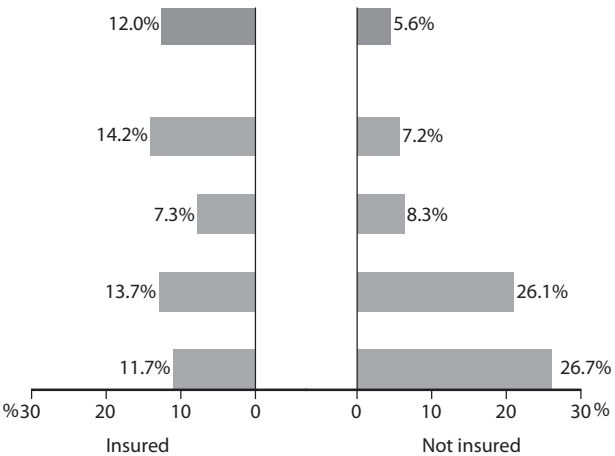
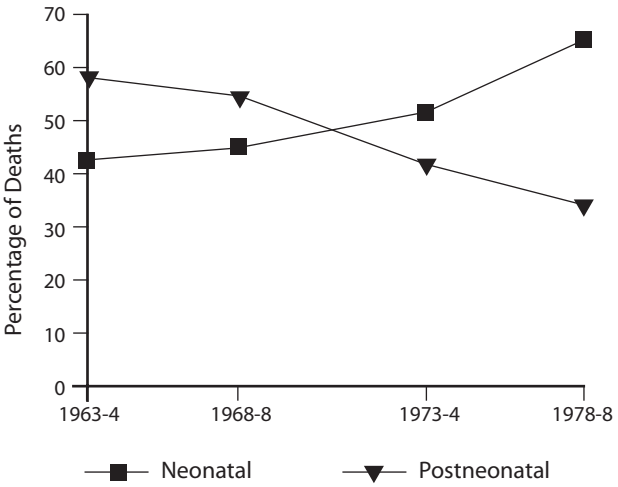


Figure 4. Percentages of neonatal and post-neonatal infant deaths in Mexico City.



growth retardation and preterm birth. Most of them occur in the first 28 days of life and become the major component of infant mortality, as a result of the decline in postneonatal deaths which had been due to diarrhoeas and acute respiratory infections. Figure 4 shows, for Mexico City, a clear cross-over between these two groups of deaths in about 15 years. This is suggested as evidence that the epidemiologic transition can also be detected in specific age groups.

Changes in the incidence of infectious diseases

The current theory of the epidemiologic transition implicitly assumes that mortality trends correspond to changes in the incidence of diseases. The evidence presented in this paper questions this assumption, especially for the case of infectious diseases.

The explanations behind the decline of the mortality rate due to infectious diseases in developed countries are quite different from thos involved in developing countries. Most of the convincing evidence given by McKeown[11] on the relatively small contribution of therapeutic and preventive medical technologies to this decline stems fron developed countries and does not necessarily apply to the developing countries.

The major improvements in the living conditions of the Mexican population undoubtedly contributed to the decilen of the overall incidence of infectious diseases. However, the beneficial effects of antibiotics, vaccines, and measures for the control of vector-borne diseases also cannot be denied, and these effects are likely to have been grater in Mexico than in developed countries, essentially because, at the time when these most infectious diseases there were still very high. The majority of these measures have produced effects that, bye and large, are reversible as will be shown below with some specific examples in contrast with the improvements in the living conditions, which are more lasting.

Many infectious diseases in Mexico, such as typhus, poliomyelitis and diphtheria, are in a trend towards possible eradicarion. However, ther are also emergent infectious diseases of which there are different types:

- Dengue fever provides a model of a *reemergent* disease, as it a had practically been eradicated in the 1970s, and has now spread to most of the coastal states.
- Malaria provides a different case since it was a disease that had been brought under control, started to increases; this type of disease can be labeled as *refractory*.

- Finally, the acquired immunodeficiency syndrome (AIDS) exemplifies a case of an authentic new emergent disease.

A full description of the changes and incidence rates of infectious diseases in Mexico is beyond the scope of this paper, and can be found elsewhere.[12-14]

The effects of the economic crisis in Mexico heave, during the past six years or so, slowed down some of the previous improvements in the standards of living. In this contest, it is possible that the mortality rates mortality rates of diarrhea and acute respiratory infections in Mexico will now only further decline by means of modern procedures that reduce the fatality rate, not the incidence rate. This is the case with oral rehydration therapy, and schemes for the treatment of respiratory infections. It is, therefore, not surprising that Mexico will, for many years, have to bear a heavy burden of health needs caused by infectious diseases.

Challenges for the health system in the twenty-first century

Decline in fertility and changes in (he age structure)

The second stage of the demographic transition, characterized by the decline of fertility, 15 started in Mexico in the middle 1970s. The birth rate dropped from 40 births per 1000 inhabitants in 1976 to 30.5 in 1982. This trend agrees with those researchers who foresaw, against the neomalthusian thesis, that in arder to reduce the fertility rate, it was necessary first to control the mortality rates.

The effects of the fertility decline on the age structure of the population are quite evident. Figure 5 shows the population pyramid for 1980, where the age group 0-4 is smaller than the age group 5-9. On the right of the figure, the pyramid for the year 2000 no longer has a wide base; instead it shows that all groups between 0-5 and 25-30 are about the same size. The proportion of adults of productive age (15-64 years) will grow from 52.5% in 1980 to 64.0% in the year 2000, an increase of about 18 million adults. This ageing process of the population will accelerate the epidemiologic transition.

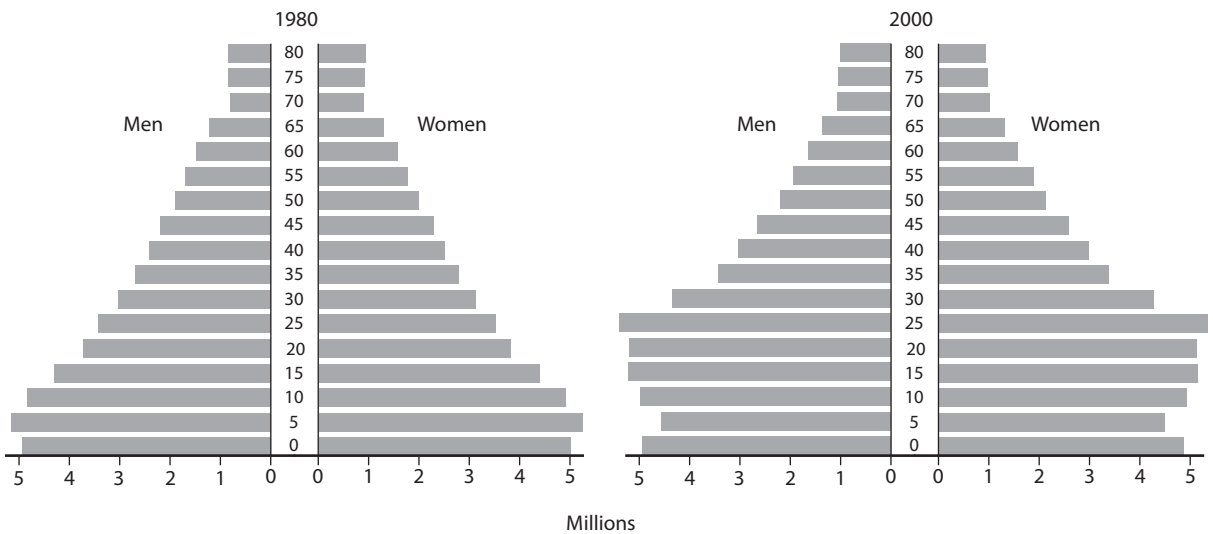
Competing needs for scarce health resources

Any discussion of a health system must attempt to understand two major phenomena: on one hand, the health conditions (or needs) of the population; on the other, the response that a society organizes to deal with those conditions. [16]

We have, in the previous sections of this paper sketched some of the major characteristics of the health éonditions prevailing in Mexico. We have also described the main changes that will occur in the age composition of the population as a result of the fertility decline. We will now proceed to analyse the consequences of the protracted epidemiologic transition on the provision of health services.

As mentioned at the beginning of this paper, the health scenario for the first 10 years of the twenty-first century will be characterized in Mexico by the coexistence of mixed pathologies, and an increasing amount of health needs at

Figure 5. Age structure of the Mexican population in 1980, and the forecast for the year 2000.



unprecedented levels. Even if during the remaining 12 years of the twentieth cenlury effective preventive measures were introduced, and the fertility rate was further reduced, the demographic and epidemiologic inertia would produce most of the expected burden of disease and disability. The lag time between the exposure to risk factors and the manifestation of some chronic diseases. such as cardiovascular problems and cancer, and now AIDS, explains this epidemiologic inertia. In other words, most of the years of exposure necessary to produce ischaemic heart disease and pulmonary cancer have already occurred in those that will be affected. In a similar way, the mothers of the births that will occur in the year 2000 have already been born. What is the implication of such inertia on health needs? We can illustrate the dilemma with the case of infant deliveries versus medical care for chronic conditions.

Based on the historic trends of fertility, it is estimated that, by the year 2000, there will be about 2450000 births in Mexico, i.e., about the same as in 1988. Although the fertility rates will have declined substantially, the number of births will not change because of the momentum of population growth. Consider that, in the past five years, only 55% of all births were delivered by a qualified professional. In the present medical model to deliver babies safely, there is a deficit of 45% for obstetric hospital beds. By the year 2000, Mexico would need new hospital beds to deliver about 1 102 500 births, i.e., the heaIth system would have to double the total number of beds available nowadays. The required budget for constructing and operating the hospitals to deliver 84 808 extra births every year for the next 13 years is formidable.

Even the most optimistic economic forecasts for the next 20 years give no indication that there will be sufficient resources to support the construction of the hospital beds to which we have just referred. However, the most profound problem is not that Mexican society may be incapable of producing the required resources to make its health system grow, but rather that the medical model for meeting health needs is inappropriate.

Clearly, the social response to the health needs of the year 2000 has to be very different. In the case of obstetric care, new innovative models, relying more on simplified health care units and on domestic resources, must be developed, tested and implemented. Hospital beds will have to be reserved for high risk deliveries only.

The problem does not end here. The burden of disease and disability will pose a situation of competing needs for whatever resources exist by the year 2000. A preliminary analysis of the number of deaths and the cases of hospitalization and ambulatory care in 1985 and in the year 2000, suggests that the number of deaths and admissions to hospitals will change only slightly between 1985 and the year 2000. Nevertheless, the admissions due to cancer and tumours, and to heart, circulatory and respiratory diseases, will increase by about 40%. The requirements of beds to deal with those admissions will be considerably larger than for infections and other acute diseases. This is because the length of stay for the former group is several times longer.

The health needs derived from reproduction, particulary those occurring during delivery, will compete in the year 2000 for the same resources required for chronic and degenerative conditions. Once again, a different model of health care will have to be developed to meet the foreseeable health needs in the year 2000. Ambulatory surgery should seriously be considered to reduce the need for hospital beds. Hospitalization to care for socially deprived patiens should be avoided through financing family and neighborhood support to the sick and disabled. Concrete and explicit norms of rationing hospital services are likely to be inevitable. In addition, the first level of care will have to be strengthened in order to reduce demand for hospitalization.

The above preliminary analysis also shows a small increase between 1985 and 2000 of consultations at the first level of care. The type of consultations will, however, be quite different. Particulary important will be the increase in cancer consultations. The competing needs between cancer and pregnancy care for the same resources will not be easy to solve. In contrast to the situation where the first level of care was mostly designed to deal with acute, episodic and short-term care, it will be necessary to shift to continuous and long-term care, where concerns for clinical and interpersonal quality and not just for the quantity of services will be of utmost importance. Such a shift will have profound implications for the composition of the health care team.

There are many factors that have not been taken into consideration in the estimates of the disease load for the year 2000. Some are likely to reduce the load, others quite the reverse. An extremely important one is that the threshold for health demand is very likely to lower with time, as the population will be more educated and better informed. A second important factor is that psychosomatic diseases are likely to increase.[17]

An essential element of the epidemiologic polarization in Mexico is the social differentiation of disease patterns. The poor will continue to be victims of the left-over

ills, whereas the relatively better-off will be the most affected by chronic and degenerative diseases. The competing health needs will not, therefore, have the same chances of winning. The infectious diseases and the health needs derived from reproduction are handicapped in the competition, since those who suffer them have less economic and political power to direct resources in their favour. Health services to deal with infectious diseases, and with pregnancy, delivery and childhood health problems, are unfortunately likely to be neglected if the prevailing health care model remains. The integration of the health system will be of paramount importance if this undesirable outcome is to be averted. Two basic principles for any new health system cannot be overemphasized: universal access, and equity in the distribution of resources.

Towards a new health model

The situation presented for Mexico in the previous two sections is probably similar to that of many other middle income countries. It is important to face the epidemiologic transition and the health polarization as a common problem, at least of these countries.

It has become quite clear, from many experiences in this century, that the urgent need to make health services more equitable and efficient will not be achieved through free market forces of ' supply and demand. Most governments will continue to assume the ultimate responsibility for the health of populations. At the same time, it will be necessary to recognize that the growing complexity of contemporary societies demands a pluralistic approach which encourages the active participation of all sectors and organizations with a primary commitment to health. Active participation can only be effective if the decision making power and the administration of services are delegated to the states or provinces. Central governments have absorbed responsibilities that belong to local authorities, creating a gap between the level at which problems arise and the level at which major decisions are taken. The health polarization among social classes in Mexico has an expression in the regional distribution of dominant patterns of disease and disabilities. For these and other reasons, there has been an active process of decentralization of health services in Mexico during the past five years, which has achieved a greater geographical balance among needs and resources.[5] Such a process is the foundation for any reform of the prevailing health care model.

In sum, while governments need not directly provide all health services, they cannot relinquish their responsibility to ensure that health care is, in practice, a social right, to be distributed on the basis of need and not of purchasing power. 5 Modern health systems must be pluralistic but equitable.

Together with macrolevel structural reforms, it is necessary to make primary health care the articulating element for the entire health system at the microlevel. However, the primary health care approach needs to be defined more specifically in order to respond to the complex health needs of middle-income countries. It is important to eliminate the notion of 'primitive' or 'precarious' healt care that is often taken to be synonymous with primary health care. Six basic principles should guide the organization of primary health services:

1. The delivery of health services should be organized for defined population groups, living within specific geographical boundaries. Health facilities of all levels should have *population based responsibilities.*
2. A subsystem of *quality* assurance is essential, since equity entails not only more services for those who most need them, but services of a different often more complex, type.[18]
3. *The participation of the community should* be encouraged and supported. This implies three majar changes. First, individuals and families should assume an increasing share of responsibility to prevent specific pathologic conditions. Second, it is necessary to reinforce thé culture of family and social support for the sick, the disabled and all vulnerable groups (e.g., pregnant women, children and the aged). And, third, the process of local decision making should formally incorporate the voice and opinion of organized groups in the community.
4. The delivery of services needs to be reoriented to deal with the atenuation and prevention of risk, and not only with diseases and other health losses. This is a principle of anticipatory care.
5. The mode of operation should effectively be more *integrative*, so as to coordinate interventions with other sectors of development (e.g. housing, education, recreation) that are relevant to improve the determinants of health.
6. *Innovative models* of health care should be developed and tested in order to increase the technical capacity to resolve problems at the local level. An example of this is the development of the Advanced Centers for Primary Health Care in Mexico and Cali, Colombia, which involve, among other things, the adaptation of

health centers to provide low-risk obstetric care, ambulatory surgery and emergency care, together with an ongoing system for monitoring performance.

7. The transition of health and disease requires a transition in the structure of the health system. Any substantial structural change in the health system would entail, by necessity, modifications in the tasks for which human resources are trained. The new health care model, therefore will demand the reorientation of medical and paramedical education. Skills needed for team work, and for broadening the scope and meaning of health, will probably create new personnel profiles.
8. A common characteristic of middle-income nations is their scientific and technological dependence on develop countries. The economic crisis of this decade has accelerated the urgent need to develop new forms of organization, new technologies and new types of personnel. The social response to the complex health needs of the future will have to be designed on the basis of scientific research with regard to both the evolving epidemiologic reality and the relative effectiveness of interventions. The process of designing, implementing and testing innovations has to be systematic and problem-oriented. Health research should, therefore, not be seen as a luxury, but as the foundation of change and independence.

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A framework for assessing the performance of health systems*

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There is wide variation in health outcomes for countries with similar levels of income and education[1, 2]. Some of this variation is due to differences in health system performance. Differences in the design, content and management of health systems translate into differences in a range of socially valued outcomes, such as health, responsiveness, or fairness. Decision-makers at all levels need to quantify the variation in health system performance, identify factors that influence it and articulate policies that will achieve better results in a variety of settings. The performance of system sub-components, such as regions within countries or public health services, also needs to be assessed. Meaningful, comparable information on health system performance, and on key factors that explain performance variation, canstrengthen the scientific foundations of health policy at international and national levels. We believe that a convincing and operational framework for assessing health system performance is vital for the work of governments, development agencies and multilateral institutions.

Several frameworks for measuring health system performance have been proposed[3±10] and are testimony to the importance given to this enterprise. Taken together, these frameworks are a rich source of ideas and approaches. Nevertheless, we believe that there is room for improvement. For example, approaches to health system performance often fall into two related traps. Some are inclusive lists of multiple, and often overlapping, desirable attributes of health systems. Various frameworks, for example, have included goals related to health, health inequalities, coverage, equitable financing, quality, consumer satisfaction, allocative efficiency, technical efficiency, cost containment, political acceptability, and financial sustainability. Other approaches start from a consideration of which indicators are readily available, and construct a performance assessment that replicates the conceptual and technical inadequacies of available measures. Both approaches are unsatisfactory for a comprehensive and meaningful assessment of health system performance.

We believe that a coherent and consistent framework should begin with addressing a simple question: what are health systems for? Once the intrinsic goals of health systems have been clearly articulated, these goals must be measured, and both the concept of performance and the key factors that influence performance must be explored.

This paper is both a framework and a blueprint for further refinement and development work that WHO will pursue over the coming years. A major application of

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this framework will be to structure the statistical annexes of the *World Health Report*. Beginning in 2000, the report will present information on health system performance for each country.

In developing the conceptual basis for health system performance, this paper covers eight topics: the boundaries of the health system, the difference between intrinsic and instrumental goals, mapping between social systems and social goals, the main goals of a health system, the instrumental goals for health systems, the concepts of performance and efficiency, applying the concept of performance to subsystems or institutions, and key factors influencing health system performance. Some implications and future directions are presented in the discussion.

Boundaries of the health system

Many boundaries have been proposed for separating the health system from elements outside of it[11±16]. Some components, such as individual health services delivered at clinics, are included by all boundary definitions. But there is more controversy with other components. For example, are seatbelt regulations and their enforcement part of the health system? Clearly, all boundary definitions are arbitrary, but to undertake an assessment of health system performance an operational boundary must be proposed.

We construct such an operational definition by beginning with the concept of a 'health action'. A health action is defined to be any set of activities whose primary intent is to improve or maintain health. And a health system includes the resources, actors and institutions related to the financing, regulation and provision of health actions. This primary intent criterion leads to a broad definition of the health system. For example, it includes efforts to improve road and vehicle safety where the primary intent is to reduce road traffic accidents, and it also includes personal health services whether they contribute to health or not. One major advantage of the primary intent criterion is that it includes in the assessment of health system performance all actors and institutions who see their primary purpose as contributing to health.

Many actions that profoundly influence health, such as educating young girls, are not part of the health system according to this definition, as the primary intent of education is not to improve health. Excluding these actions from the definition of a health system does not, in any way, question the importance of determinants of health that are outside the health system. In addition, it is critical to recognize that efforts to influence other sectors are clearly part of the health system when they improve determinants of health, such as educating young girls or reducing social inequalities. These efforts at intersectoral action are intended to improve health and therefore fulfil the primary intent criterion.

Even with a clearly articulated definition of a health action, questions remain about a range of actions. For example, what is the primary intent of food supplementation programmes: to improve health by preventing malnutrition, or to redressincome inequality? For ambiguous cases, particularly in the area of water and nutrition, some arbitrary decisions must be made so that health systems are consistently defined. Such codification of the boundaries of health systems is essential to this exercise and to related efforts, such as national health accounts. While important for practical measurement, resolution of this limited number of ambiguous cases is not relevant to the rest of this paper.

Intrinsic and instrumental goals

Many laudable goals have been articulated for social systems, including the health system. To have an informed debate about goals, however, we need to distinguish between intrinsic goals-goals valued in themselves-and instrumental goals, whose pursuit is really a means to another end. Intrinsic goals fulfil the following two criteria:

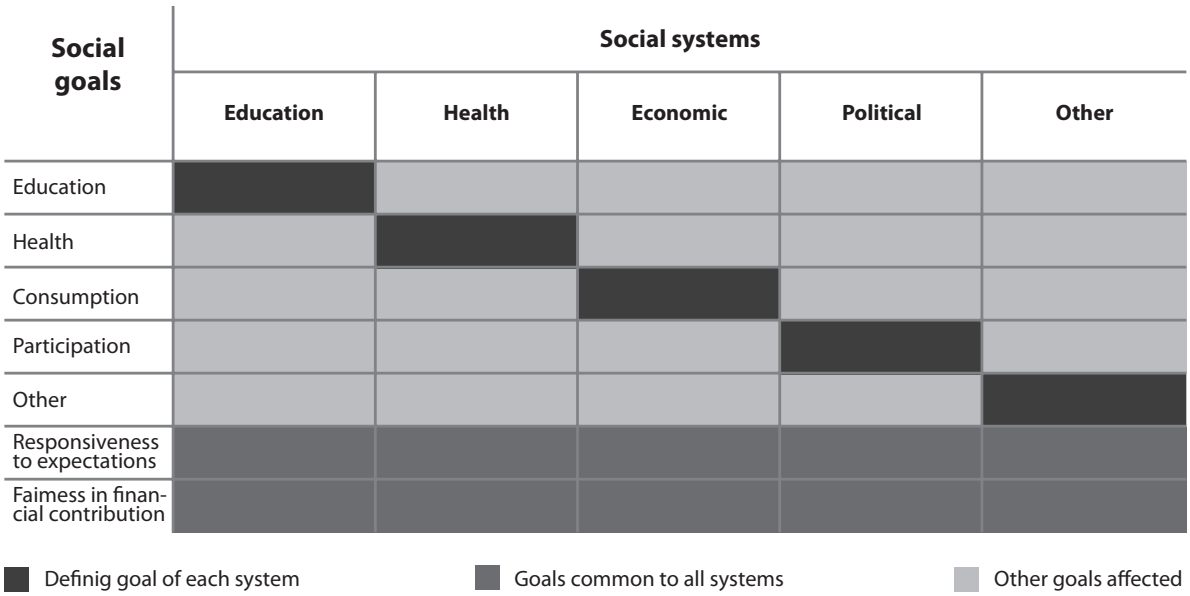
- It is possible to raise the level of attainment of the goal, while holding the level of all other intrinsic goals constant. In theory, a given intrinsic goal is at least partially independent of all others.
- Raising the level of attainment of an intrinsic goal is desirable. If it is not, it is probably an instrumental goal and not an intrinsic goal.

Desirable goals that do not fulfil both of these criteria are likely to be instrumental goals. We will use the distinction between intrinsic and instrumental goals to keep the list of goals for the health system parsimonious and to simplify measurement of goal attainment.

Social systems and social goals

As shown in Fig. 1, the organized activity of society can be divided into various systems such as education, health, economic, political, etc. For each of these systems there is a defining goal, the reason for which the system exists. The

Figure 1. Social goals and systems



goal of the education system, for example, is to educate individuals; and for the health system it is to improve health. In addition to the defining goal, there are two other goals common to all systems. They are the responsiveness of the system to the legitimate expectations of the population; and fairness in the financial contribution required to make the system work. For all systems and defining goals, the population will have expectations about how institutions and actors should interact with them as they attempt to achieve a goal. For example, are human rights respected? To what extent are individuals autonomous and involved in decisions? Are people treated with dignity?

Similarly, there is the goal of fairness in financial contribution for every system. The definition of fairness may vary considerably for different systems. Perhaps the market mechanism ou pay for what you get is appropriate for most consumption goods. But for health, education, security and some other systems, the concept of fairness in financial contribution may be very different.

The health, education or security systems may and probably do affect (positively or negatively) attainment of the defining goals of other systems. Recognizing these interactions, we can define a series of cross-system goals for each system. The matrix of systems and goals emphasizes the interdependence of all parts of society and the multiple social goals to which all systems may contribute. At the same time it also recognizes the primacy of the defining goal and the common goals of responsiveness and fairness of financing.

Health system goals

Based on the matrix in Fig. 1, we can more explicitly formulate the three main goals for the health system: health, responsiveness and fairness in financial contribution. These intrinsic goals should be routinely monitored by all countries and should form the main basis for assessing health system performance in programmes facilitated by WHO. Therefore, assessments of goal attainment are focused on measuring these three goals, and on relating goal attainment to resource use, to evaluate performance and efficiency.

There are also cross-system goals for the health system that are potentially important and that should be the subject of special analysis and evaluation. For example, how much does the health system help or hinder education, democratic participation, economic production, etc? One of the more important cross-system goals is the contribution of the health system to economic production, since health and health systems may increase or decrease economic production. For example, some methods of organizing health financing, such as certain employment-based insurance, may hinder labour mobility and macroeconomic performance[17,18]. At the same time, increasingly there is

evidence that improvements in health can enhance economic growth[19, 20]. These are important areas for further research, but the nature of the cross-system relationships and the complexity of measurement precludes them from routine assessment of health system performance.

The following discussion aims to articulate more precisely the content of each of the three goals.

Health

The defining goal for the health system is to improve the health of the population. If health systems did not contribute to improved health we would choose not to have them. The health of the population should reflect the health of individuals throughout life and include both premature mortality and non-fatal health outcomes as key components. We are concerned both with the average level of population health and with health distribution inequalities within the population[21].

Responsiveness

The second intrinsic goal is to enhance the responsiveness of the health system to the legitimate expectations of the population. Responsiveness expressly excludes the health improvement expectations of the public, as these are fully reflected in the first goal above. The term "legitimate" is used to make it clear that although some may have frivolous expectations for the health system these should play no part in articulating responsiveness.

We propose that responsiveness has two major components. The first can be called "respect for persons", and it captures aspects of the interaction of individuals with the health system that often have an important ethical dimension. Respect for persons has three aspects.

- *Respect for dignity*. Health systems might be able to achieve higher levels of health by incarcerating individuals with a communicable disease or sterilizing individuals with a genetic disorder, but this would be a violation of basic human rights[22±24]. Respect for dignity also includes interactions with providers, such as courtesy and sensitivity to potentially embarrassing moments of clinical interrogation or physical exploration[25±29].
- *Respect for individual autonomy*. The individual should be able to act autonomously when making choices about his/her own health. Individuals, when competent, or their agents, should have the right to choose what interventions they do and do not receive[25±27, 30±32].
- *Respect for confidentiality*. When interacting with the health system, individuals should have the right to preserve the confidentiality of their personal health information[33,34]. Respect for confidentiality serves an instrumental goal of improving the quality of health care; when individuals have confidence that the confidentiality of their personal health information will be respected, they are more likely to give important medical history information to health care providers. In addition, respect for confidentiality is intrinsically valuable because it upholds a core notion of privacy and individual control over personal information[27, 35±39].

The second component can be called "client orientation", and it includes several dimensions of consumer satisfaction that are not a function of health improvement. Client orientation has four aspects.

- *Prompt attention to health needs*. Surveys of population satisfaction with health services routinely demonstrate that prompt attention is a key dimension[40±44]. Individuals value prompt attention because it may lead to better health outcomes; this instrumental value is captured in the defining goal of health. Individuals may also value prompt attention because it can allay fears and concerns that come with waiting for diagnosis or treatment. Both the intrinsic and instrumental value of prompt attention are critically affected by factors such as physical, social and financial access.
- *Basic amenities*. The basic amenities of health services, such as clean waiting rooms or adequate beds and food in hospitals, are aspects of care that are often highly valued by the population[45].
- *Access to social support networks for individuals receiving care*. Even when care is promptly available, if it is provided far from the individual's family and community, access to social support networks during care and recovery may be hampered. An expectation of access to social support is not only an instrumental goal, because it may enhance health outcomes, but it is also an intrinsically valued attribute[46].
- *Choice of institution and individual providing care*. Patients may want to select who provides them with health care[43]. This concern is most often for the individual provider and only secondarily for the institution providing care. Choice is a legitimate component of responsiveness and takes on an increasing importance as other items in this list have been satisfied.

As with health, we are concerned not only with the average level of responsiveness, but also with inequalities in

its distribution. A concern for the distribution of responsiveness across individuals means that we are implicitly interested in differences related to social, economic, demographic and other factors.

Fairness in financial contribution

To be fair, financing of the health system should address two key challenges. First, households should not become impoverished, or pay an excessive share of their income in obtaining needed health care. In other words, fairness in financial contribution requires an important degree of financial risk pooling. Second, poor households should pay less towards the health system than rich households. Not only do poor households have lower incomes but a larger share of their income goes to basic needs such as food or shelter. Contribution to the health system should reflect this difference in disposable income between rich and poor.

These considerations translate into the normative proposition that every household should pay a fair share towards the costs of the health system. (In the case of very poor households, "fair share" might mean no payment at all.) Payment should be based on income and for the most part should not reflect use of services or risk. Acceptable notions of a fair share for the poor depend on the role assigned to the health system in general income redistribution. In some political settings, it may be easier to redistribute income by providing free health services to the poor than through direct redistributive mechanisms. From the perspective of the health system, however, it should perhaps be assumed that society is redistributing general income through other mechanisms, such as direct transfers, when evaluating fairness in financial contribution. The broad social acceptance of a financing mechanism requiring that everyone contribute some fair share may also lead to more sustainable health financing.

Fair financing begins from an *ex post* perspective since it refers to past household payments for health care through all mechanisms (out-of-pocket expenditures, private voluntary insurance, social insurance, general taxation, excise taxes, etc.) compared to their income. This *ex post* view is very closely related to the *ex ante* view of the risk a household faces for health care expenses in the coming year[47]. Indeed, the *ex post* distribution of household health expenditure is the realization of the *ex ante* distribution of financial risks.a The difference between the two for a population is the effect of chance. That difference could be considerable for a small sample of households but not for a large one. In other terms, a particular *ex post* distribution of household health expenditure could be caused by a relatively small range of distributions of *ex ante* health expenditure risks. Because of the close relationship between the two, the goal of fair financing encompasses concerns about financial risk protection in the population.

In summarizing our view of health system goals, Fig. 2 shows that we are interested in assessing both the average level and the distribution of the first two goals, namely health and responsiveness. By contrast, however, for the third goal, concerning financial contribution, we are interested only in the distribution and not the average level. The level of health financing is a key policy choice in any society, but it is not an intrinsic goal. Whereas it is always desirable to achieve more health and more responsiveness, it is not intrinsically valuable to spend an ever-increasing amount of money on the health system. Rather, what matters is that the financial burden should be fairly distributed across groups. The level of resources invested in the health system is the variable against which performance is measured, and in the following sections we stress the importance of comparing health system resources when assessing goal attainment.

The proposed framework is directly related to the familiar concepts of quality, equity and efficiency.
Thus the level of goal attainment for health and responsiveness can be considered as the overall quality of the health system. This is a broader concept than definitions of quality focused on personal health services alone[48, 49]. As explained more fully below, quality is a subset of overall goal attainment, not a performance measure.

Similarly, the distribution of the three goals can be considered as the total equity of a health system. As with quality, equity of the health systemis a subset of overall goal attainment and not a performance measure. Our

Figure 2. Health system goals in relation to components for assessment

Components for assessment / Goals	Average level	Distribution
Health improvement	✓	✓
Responsiveness to expectations	✓	✓
Fairness in financial contribution	–	✓

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concept of the equity of the health system is broader than simple health inequalities, reflecting the broad assessments in recent work[50].

A third, related concept is efficiency, or composite goal performance. Efficiency is how well the socially desired mix of the five components of the three goals is achieved, compared to the available resources. Composite goal performance and individual goal performance are discussed in more detail below.

Societies will inevitably differ on the weighting they give to these components. Nevertheless, we believe that for the purposes of global comparison, it will be useful to develop a consensus weighting function. This would allow composite measures for both goal attainment and efficiency to be calculated for health systems. Such a consensus weighting function for global comparisons should be built on some common values framework[51], and take into consideration empirical measurements of individual preferences for the different goals in various societies. Ultimately, the use of a composite measure of goal attainment will be limited but, like the Human Development Index[52], it may spark increased attention to the performance of health systems and the factors explaining such performance.

Instrumental goals

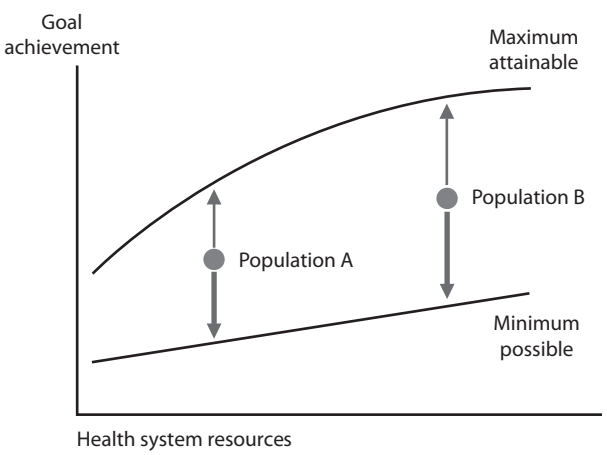
In addition to the three main goals for health systems there are many goals that have been given prominence in discussions of health system performance, such as access to care, community involvement, innovation or sustainability. While we do not doubt their importance, these are instrumental goals whose attainment will raise the level of health, responsiveness and fairness in financing. For example, consider access to care. If we fix the level and distribution of health, responsiveness and fairness in financing, but change the level of access, we argue that this would not be intrinsically valued. Improved access to care is desirable insofar as it improves health, reduces health inequalities and enhances responsiveness. But it is an instrumental, rather than intrinsic, goal for health systems. If attainment of the three intrinsic goals is measured adequately, this would fully reflect the impact of access to care (or other instrumental goals) on health outcomes valued by society. Likewise, coverage of many effective public health programmes, such as DOTS for tuberculosis, immunization, or impregnated bed-nets for malaria, are instrumental goals that would be captured in the measurement of health and responsiveness.

Goal performance, composite goal performance and efficiency

With a clearly defined set of goals and their measures, we can compare the level of goal attainment for different health systems. There is a long history of comparing measures of health across countries. The concept of performance, however, is more complex than simply recording the level of goal attainment. Performance of the health system involves relating goal attainment to what could be achieved[21, 53]. In other words, performance is a relative concept. A rich country has higher levels of health than a poor one, but which country has a higher level of performance relative to health system resources? We argue that performance should be assessed relative to the worst and best that can be achieved for a given set of circumstances. Fig. 3 illustrates the concept of performance with respect to the goal of improving population health. The y-axis shows health, and the x-axis shows resources spent on the health system. The top line shows for populations A and B the maximum attainable level of health for each level of health expenditure, given the non-health system determinants such as the level of education. It is clear from the figure that performance is related to the level of health expenditure; for example, population A has a lower level of health than B, but the two populations have approximately the same levels of performance and expenditure.

Measuring goal performance is related to the question: Does one hold the health system accountable for the level of key health determinants that are not entirely the responsibility of the health system, but can be influenced by it? We argue that the answer must be "yes". The health

Figure 3. The concept of performance



system should be held accountable for these broader determinants of health, to the extent that the best health system can influence them compared to the worst health system. For example, it has been argued that we should not judge the performance of a health system to be poor simply because the population level of tobacco consumption is high, which leads to low levels of health. The implication of this argument is that health systems should not be held accountable for determinants such as tobacco consumption, diet or physical activity. Yet the counter-argument is strong: a good health system should pay attention to the level of tobacco consumption, or to the composition of the population's diet. In defining performance, we believe careful attention should be paid to determinants that the health system can be held accountable for. Thus, health systems should be held substantially accountable for the levels of tobacco consumption; but probably not for levels of educational attainment.

The extent to which a health system should be held accountable for a health determinant can be determined from the degree to which the best health system can change the level of that determinant. However, the degree to which a health system can change a determinant is related to the time frame of the analysis. Many health sector reforms and institutional changes may take several years to have their full effect and thus require a longer-term perspective for assessment. For example, what a health system can achieve in one year to reduce tobacco consumption is different from what a health system can do in five or ten years. Thus, measurements of performance should not be overly sensitive to the starting point for a given year. We argue that performance should be assessed with a longer time horizon, and when the maximum goal for a given level of health expenditure is calculated this should include what can be achieved over many years. Otherwise, health systems are never held accountable for past mistakes, or given credit for past successes.

Performance can be assessed for each of the five components of the three goals. In the face of scarce resources, societies will choose the relative importance of these goals. In other words, by choice, a society may perform poorly on responsiveness, but well on health inequality, because more resources from the total budget are assigned to redressing inequalities than to enhancing responsiveness. Ultimately, a single budget for the health system is used to achieve all of the goals. Because there will be tradeoffs between some of the goals, performance in achieving the composite of the three goals is also a useful construct. In economics, the concept of efficiency means producing a desired output at least cost or producing the maximum quantity for a fixed budget*[54]. In this sense, composite goal performance how well a health system achieves the desired outcomes given available resources is also the efficiency of the health system. We will use interchangeably the term 'composite goal performance' and 'efficiency' in the rest of this work.

As noted in the section on health system goals, societies may value the five components of the three goals differently. Each society must make its own policy choices and this can affect the extent to which each of the three goals are attained. Nevertheless, we believe there will not be great variance in the importance attached to different goals for most societies in the world. Shared conceptions about the importance of these goals[51] will allow for meaningful performance comparisons between countries for each of the five components of the three goals and for composite goal performance. These comparisons will provide an empirical basis for debates on the effect of different patterns of health system organization. By facilitating these comparisons of performance and efficiency, the framework proposed here can enrich policy debates on the design, organization and operation of health systems. Measuring performance and efficiency using a common framework does not mean that one particular health system design will emerge from the analysis as a blueprint for all countries.

Performance of subsystems or organizations

Performance of the entire healthsystemmustberelated to the performance of various subcomponents, or even organizations such as hospitals, within the health system. Work on the performance of providers of personal health services is converging with work assessing the overall performance of health systems. For example, theUSAgency for Health Care Policy and Research is exploring the development of a national quality of care measure, constructed from quality measures of component provider organizations[4]. The conceptual framework we have presented for performance of the entire health system is largely applicable tosubcomponents,suchas the non-personal health services, or to specific organizations such as a hospital or outpatient care provider. The key would be to compare the level of goal attainment for the entire population to the level of goal attainment that would be achieved with the best and worst performance of that subsystem or organization. Of course, the challenge will behowto define the

best and worst attainable lines for a given sub-system or organization. This mapping from the framework for the overall system to its subcomponents will work well for the level of health and responsiveness. In contrast, the potential contribution of any one organization to the distributional goals will be much smaller and much more difficult to estimate. As this framework for assessing health system performance is developed and implemented, further work on its application to organizations and subsystems will be needed.

It is also important to note that the applicability of the approach to specific organizations or subsystems does not imply that the overall performance of the system is a simple (additive or even multiplicative) function of the performance of different subsystems or organizations. Interactions between, for example, the performance of intersectoral activities in reducing exposure to tobacco through excise taxes, and the performance of hospitals and clinics, will be highly complicated. Ultimately, it may not be possible or even useful to try to define the relationship between overall performance and the performance of various subsystems or organizations.

Factors explaining health system Performance

Any systematic attempt to understand the performance of health systems should include a study of factors that potentially explain it. Reforms improving performance require information on explanatory factors. Of the extensive array of reform candidates, which ones should be measured and analysed? This task could be approached through the development of extensive lists of technical and institutional factors. In developing such lists tension is often revealed between those groups focused on the technical content of health services (e.g., immunizations or intensive care units) and those focused on institutional arrangements of the health system (e.g., provider payment mechanisms or social insurance). It is necessary to provide some framework for thinking about the dimensions of health systems that may influence performance and to put in place ways of measuring these dimensions. This topic is treated more extensively elsewhere[55±57.]

Developing a categorization and a series of measures of key factors that may explain variation in health system performance is a very different task than articulating the goals of health systems. Each proposed factor represents a hypothesis that should be tested empirically. For this reason, any list is provisional and subject to expansion or contraction as evidence accumulates.

As shown in Fig. 4, in every health system organizations have to perform four basic functions: financing, provision, stewardship and resource generation (human, physical and knowledge)[56]. Every health system grapples with the key problems of designing, implementing, evaluating and reforming the organizations and institutions that facilitate these functions. It is possible to compare solutions to these problems along three major categories, which form a continuum from broad policy directions to specific operational attributes: strategic design, structural arrangements and implementation management. In the following sections, we specify the elements for each function. This is a useful beginning, but further research is required to understand how organizational and institutional solutions affect performance.

Financing

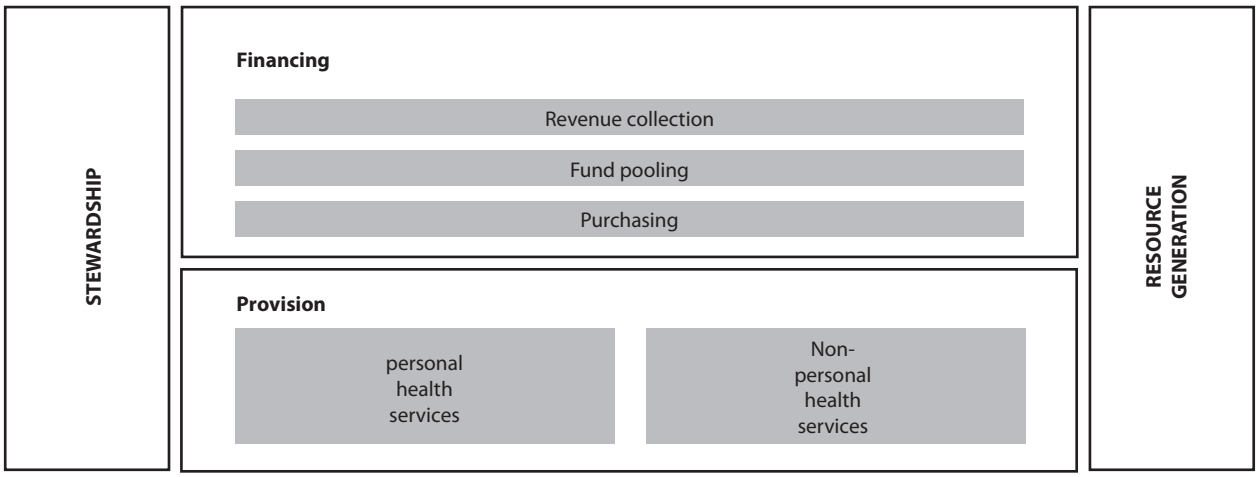
Health system financing is the process by which revenues are collected from primary and secondary sources, accumulated in fund pools and allocated to provider activities. For the purposes of analysis, it is useful to divide health system financing into three subfunctions: revenue collection, fund pooling and purchasing.

Revenue collection refers to the mobilization of money from primary sources (households and firms) and secondary sources (governments and donor agencies). Funds can be mobilized through eight basic mechanisms: out-of-pocket payments, voluntary insurance rated by income, voluntary insurance rated by risk, compulsory insurance, general taxes, earmarked taxes, donations from nongovernmental organizations and transfers from donor agencies.

The strategic design of revenue collection is likely to affect health system performance in a profound way. Some of the key dilemmas that decision-makers face include compulsory versus voluntary payments, prepayment versus payment at the point of service, and progressivity of insurance premiums or fees. A key aspect of the structural arrangements of revenue collection, with potential effects on performance, is the governance of institutions, mostly as it refers to the extent of public versus private

* More formally, production efficiency is based on the concept of a Pareto optimality, in which production factors are allocated such that it is not possible to reallocate factors to produce more of one good without producing less of another.

Figure 4. Functions of health systems



Stewardship concerns financing, provision and resource generation.
Resource generation concerns financing, provision an stewardship.

participation. Another important decision matter has to do with the number of organizations that carry out this function, which in turn raises questions of economies of scale and concentration. Implementation management issues that might affect performance include measures to avoid evasion, specific collection procedures and earmarking of taxes.

Fund pooling refers to the accumulation of revenues for the common advantage of participants. Indeed, pooling means that financial resources in the pool are no longer tied to a particular contributor and contributors share financial risk. Pooling is distinct from revenue collection, as some mechanisms of revenue collection, such as medical savings accounts, do not share financial risks across contributors [58].

Aspects of the strategic design of fund pooling that are likely to affect performance include the extent to which there are separate fund pools for different population groups, separate fund pools for personal and non-personal health services and crosssubsidization between low-risk and high-risk contributors. Structural arrangements of fund pooling include the size and number of fund pools, mechanisms to transfer funds among pools, choice and competition among fund pools for enrolment, and governance of institutions maintaining fund pools. A critical implementation management question that might affect performance refers to rules that guide the entry and exit of organizations performing this function, including procedures for protecting contributors in the case of insolvency or bankruptcy. Another regulatory matter is the rules governing the financial management of the funds, including the degree of investment risk that is allowed.

Purchasing is the process through which revenues that have been collected in fund pools are allocated to institutional or individual providers to deliver a set of interventions. Purchasing can range from simple budgeting exercises in highly integrated public systems, where the government collects revenue through general taxation and allocates it to programmes and facilities for staff and other costs, to more complicated strategies where specified units of inputs, outputs or outcomes are purchased.

Strategic design includes decisions on what is purchased, how it is purchased and from whom it is purchased. Choosing what is purchased has to do with the criteria used to select interventions for inclusion or exclusion. Alternative mechanisms include direct purchasing of interventions (coronary artery bypass grafts, childhood immunizations etc.), more general purchasing of service types (physician services, hospital bed-days, etc.), or purchasing of inputs (doctors, hospital beds or vehicles). Another aspect of strategic design is the choice of providers to deliver interventions, including issues such as command and control procedures or contractual processes that relate the purchaser to providers, the criteria for choosing providers, and provider payment mechanisms.

Structural arrangements that may affect performance include the size and number of purchasers,the mechanism of funding purchasers from revenue pools, choice and competition between purchasers for enrolment, and governance of purchasers. The most impor-

tant matters of implementation and management are methods for controlling the quantity and the quality of purchased services. It is beyond the scope of this paper to examine the vast array of utilization review and quality assurance techniques that may be used to orient purchasing decisions. Many of them form the core of what has been termed "managed care".

Provision of health services

This function refers to the combination of inputs into a production process that takes place in a particular organizational setting and that leads to the delivery of a series of interventions. In analyzing provision, it is useful to keep in mind the conventional distinction between personal and non-personal health services. The former refer to services that are consumed directly by an individual, whether they are preventive, diagnostic, therapeutic or rehabilitative, and whether they generate externalities or not. The latter refer to actions that are applied either to collectivities (e.g., mass health education) or to the non-human components of the environment (e.g., basic sanitation).

Personal health services. The strategic design of providing personal health services deals mostly with the relationships of each provider organization to its environment. One set of such relationships has to do with vertical integration among functions. While this matter is analysed in more general terms below, it is necessary to underscore its importance for the provision function, since in this case the most fundamental design question refers to the extent of integration with the purchasing function. Indeed, national health systems are often distinguished according to whether these two functions are carried out by the same organization, or whether providers are independent contractors for purchasing entities. One of the main current reform proposals for integrated systems is precisely the "purchaser±provider split". Closely linked to this matter is the issue of decentralization and governance of provider institutions, particularly with respect to the extent of autonomy, even in a framework of public ownership. The extent to which such fundamental design options affect the performance of health systems is an important research question with major policy implications. Structural arrangements have to do mostly with the relationships of provider organizations with each other. A central question is the extent to which such organizations are separate entities, or whether they form networks at different levels of complexity (i.e., primary, secondary and tertiary care facilities). The structure of such networks will determine whether access to a facility is direct, or whether there is a gatekeeping role for first-contact providers. This is one instance of the more general problem of organizing referrals among levels of care, including whether referrals can cross public±private boundaries, or whether private and public networks are segregated from each other. In contrast to the first two aspects of provision, issues related to implementation management have to do mostly with the internal dimension of each provider organization, including the formal and informal ways in which each organization articulates its tasks, control systems and relationships of authority[59]. Staffing patterns for both management and clinical services are important elements[60]. Typical issues include whether top management of provider organizations is in the hands of physicians or of professional administrators. At the clinical level, the question of skill mix among the various categories of providers (physicians, nurses, community health workers, etc.) is also likely to be a determinant of performance.

Non-personal health services. Conceptually, the same issues apply to non-personal health services as to personal services. Nevertheless, in most countries the public sector, often the Ministry of Health, takes a dominant role in providing nonpersonal health services.

A key question for strategic design is the extent to which single organizations provide a wide array of non-personal health services, or whether multiple specialist organizations provide specific services such as health promotion, occupational safety or road traffic safety. As with personal health services, the extent of integration with purchasing is important, as is the nature of governance and autonomy.

A main issue for structural arrangements appears to be the degree of integration of nonpersonal and personal health service provision. In public systems, are the same organizations and managers responsible for both categories of services? In systems with private providers, are there incentives and other mechanisms for them to deliver some non-personal services as well, such as mass health education?

Finally, the same issues of intra-organizational management that were highlighted for providing personal health services would apply here as well.

Resource generation

Health systems are not limited to institutions that finance or provide services, but include a diverse group of organizations that produce inputs to those services, particularly

human resources, physical resources such as facilities and equipment, and knowledge[15]. This set of organizations encompasses universities and other educational institutions, research centres, and companies producing specific technologies such as pharmaceutical products, devices and equipment.

Questions of strategic design, structural arrangements and implementation management will vary according to the specific subset of organizations involved in resource generation. For example, in the case of training institutions, such as medical and nursing schools, a key issue refers to their primary organizational location, i.e. whether they belong to the ministry of health or the ministry of education. Organizational ownership may determine the match between supply and demand for health personnel. In the case of research organizations, questions of autonomy in determining priorities become salient. In the case of the pharmaceutical and other technological industries, common questions of industrial structure, such as the degree of concentration and the extent of competition, are very likely to influence health system performance.

Stewardship

A neglected function in most health systems, stewardship goes beyond the conventional notion of regulation. It involves three key aspects: setting, implementing and monitoring the rules for the health system; assuring a level playing field for all actors in the system (particularly purchasers, providers and patients); and defining strategic directions for the health system as a whole. To deal with these aspects, stewardship can be subdivided into six subfunctions: overall system design, performance assessment, priority setting, intersectoral advocacy, regulation, and consumer protection[56].

Overall system design. This has to do with policy formulation at the broadest level. It involves the way in which all the other health system functions are put together. The various issues that have been analysed above under the rubric of strategic design form the substantive content for this subfunction of stewardship. In this respect, stewardship can be thought of as a meta-function, insofar as it deals with the organization of all the other functions of a health system.

Performance assessment. An essential ingredient for providing strategic direction and assuring a level playing field is to assess the performance of institutions involved in revenue collection, purchasing, provision and resource development. This is another meta-function.

Priority setting. Choosing criteria for setting priorities and building a consensus around them are major elements of stewardship. This has both a technical and a political aspect.

Intersectoral advocacy. This is the promotion of policies in other social systems that will advance health goals. As mentioned earlier, social and economic determinants of health status, such as female education, are not themselves part of the health system. However, advocating progress on those determinants, with the purpose of improving health, clearly fits our definition of a health action and therefore falls within the boundaries of the health system.

Regulation. Strictly speaking, regulation means setting rules. In the health system there are two main types of regulation: sanitary regulation of goods and services, and health care regulation. The former refers to conventional efforts by sanitary authorities to minimize the health hazards generated by the goods and services throughout the economy, especially those associated with foodstuffs. Health care regulation refers to organizations charged with the financial, provision and resource development functions of the health system. In this respect, regulation is again a meta-function directed at institutions charged with other functions, through instruments such as accreditation, certification and rate setting.

Consumer protection. Both the insurance and the health care markets are characterized by information and power asymmetries between consumers and producers. Therefore, part of the stewardship function is achieving a level playing field for the actors of the heath system.

The mix of these six subfunctions of stewardship is the key decision regarding its strategic design.

Indeed, there seems to be remarkable variation in the extent to which health authorities assume responsibility for each subfunction. With respect to structural arrangements, the main policy consideration refers to the locus of responsibility. While stewardship generally entails a set of core public functions, there is variation in the allocation of responsibility to different branches (executive versus legislative) and levels (national versus local) of government.

Finally, an important question of implementation management that affects performance refers to the actual skills to carry out stewardship functions. In particular, the reorientation of most ministries of health, from their traditional function as providers of services, to the new challenges of stewardship involves major organizational re-engineering for which the skill mix may not be adequate.

Vertical integration

As indicated earlier, health system performance is related not just to the organization of each separate function, but also to the way in which each function relates to the others. For example, vertical integration, whereby one entity is responsible for more than one function, is the norm, not the exception. The extent of vertical integration may matter for some combinations, such as revenue collection and purchasing or purchasing and provision, but not for others. Fig. 5 illustrates four different polar examples of vertical and horizontal integration or segmentation of financing, provision and stewardship functions. In this figure, each vertical section represents an organization which undertakes one or more function. The horizontal sections represent coverage of the population.

In the vertical and horizontal integration model the functions of financing, provision and much of stewardship are integrated into a single public sector organization covering the entire population. The UK National Health Service before the Thatcher reforms was somewhat close to this degree of complete integration. Fig. 5 also illustrates a system with vertical integration but horizontal segmentation: different organizations, each integrating the financing and provision functions, cater to different population groups. Examples that approximate this model include the segmented systems of much of Latin America. Then Fig. 5 illustrates a system with vertical segmentation and horizontal integration. Examples of this type of organization include Australia, Colombia and several autonomous communities of Spain. In fact, many of the current reform proposals aim at this type of functional organization for the health system. Health systems where there is vertical and horizontal segmentation are also illustrated.

A key policy question is the extent to which functional specialization or integration affects health system performance.

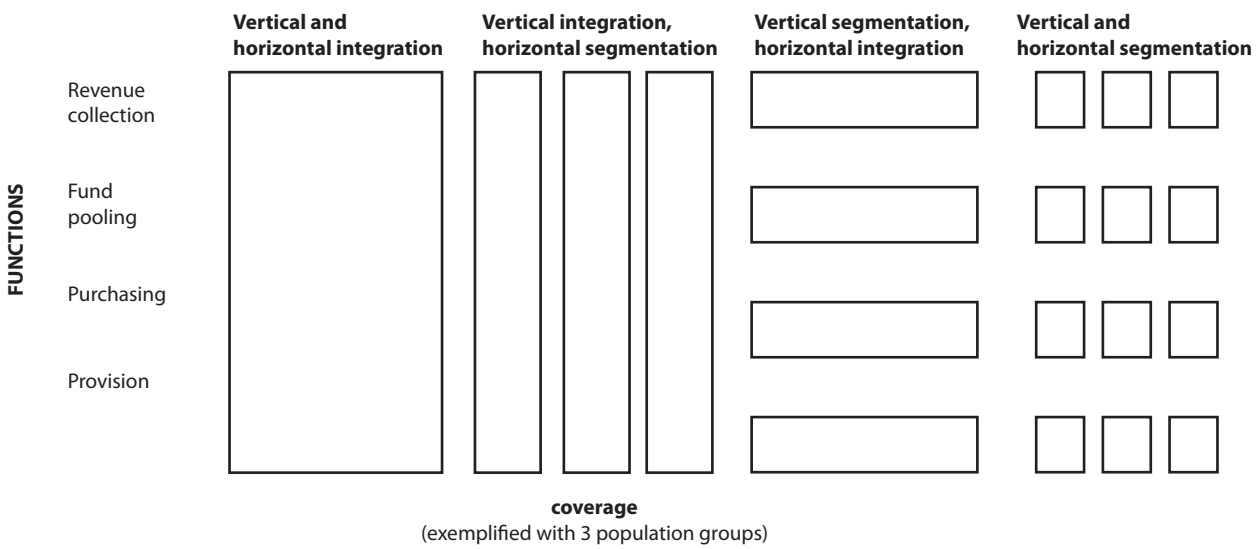
Factors external to the health system

So far, the discussion of factors that influence health system performance has focused on the organization of five key functions of health systems and the extent to which they are vertically integrated. There are, however, factors outside the health system that will influence the performance of these functions. For example, the presence of an effective judicial system can have a substantial influence on the ability of purchasers to enforce contracts on providers. General attributes of government, such as ethical codes of conduct and the tolerance of corruption can also influence the performance of stewardship and other functions. These interrelationships show that some ultimate determinants of health system performance lie outside the formal architecture of the health system.

Discussion

Amain concern for those who work on health system performance is the scope of accountability for health sys-

Figure 5. Health system models, according to types of integration



tems. Simply put, should health systems be narrowly accountable for actions within their organizations, or more broadly for key determinants of goal attainment outside the boundaries of the health system? Two viewpoints can be put forward: it is unfair to hold health systems accountable for things that are not completely under their control; and health systems can achieve greatest impact through influencing non-health system determinants of health. Through our framework for assessing health system performance, we confront this debate in three ways.

First, by describing the levels to which health system goals have been attained, regardless of the reasons that explain them, national and world attention can be brought to bear on those countries that have done well in improving health, reducing health inequalities, enhancing the level and distribution of responsiveness, and in financing the system in a fair manner.

Second, the assessment of relative performance should include how well a country is controlling the level of non-health system determinants through effective intersectoral action. Ultimately, the reason why these non-health system determinants must be included to a greater or lesser degree is that if the health system is not held accountable for them, no one will be the advocate in a country for addressing these issues. The best hope for change in many cases lies with the health system's ability to explain the importance of tackling these problems. Problems such as tobacco consumption, diet, and unsafe sexual activity must be included in an assessment of health system performance. The potential for the health system to influence other determinants, such as educational attainment, general social inequalities and biodiversity, is much less and the assessment of health system performance should reflect this fact.

Third, the scope of accountability is much narrower when assessing the performance of subsystems and institutions. Broad accountability for non-health system determinants of health belongs with the overall health system. Performance assessment for components of the system naturally narrows the scope of accountability to those actions directly influenced by the institution in question.

By approaching the problem at three levels, we feel that we can focus attention on the overall attainment of health system goals, the performance of national health systems and the performance of subsystems and institutions. By clearly distinguishing the intrinsic goals of health systems from the functional organization of the system and from the technical content of provision, we hope to facilitate a more constructive dialogue on health policy. There has long been a debate over whether health system architecture matters more than the intervention mix delivered by the systems. Interventions must be delivered by health systems and health systems without effective interventions are useless. These two views should not be seen as competitive but rather as complementary. By introducing clear measurements of health system goal attainment and performance, of the organization of key health system functions, and of the technical content of health service provision, we hope to facilitate a more reasoned and informed debate on the interaction of system architecture and intervention mix.

Much of the debate on health system design is couched in claims and counter-claims about what works and what does not work. The only support for some claims may be theoretical models or anecdotal evidence. Economists are fond of defending health policies with basic utility models. For example, if consumers are perfectly informed and providers are competitive then user fees will enhance efficiency (61). Given the extraordinary diversity of health system organization, for every anecdote there is often a counter-anecdote, and few decision-makers or health system experts have access to information on different systems and their levels of achievement.

The implementation of this framework for assessing health system performance will lay the basis for a shift from ideological discourse on health policy to a more empirical one. Over time, we should be able to provide empirical answers to such questions as the relationship between the organization of health financing and the level and distribution of health and responsiveness. This line of work should make it possible to ascertain, for example, the extent to which competition among purchasers or providers enhances responsiveness. If the framework encompasses the main intrinsic goals for health systems and the key candidate factors for explaining variation in performance, it will lay the basis for a more scientific discourse on health policy.

Annual assessments of health system performance will focus attention on the policy options available to governments for improvement. Global institutionalization of performance assessment may contribute to the ongoing reflection on the role of the state in health systems. What policies can enhance performance? What evidence is there that the state can enhance performance through the adoption of these policies? An enlightened role for the state then becomes to enhance performance, where the evidence suggests it has the potential to do so.

This framework for assessing health system performance is work in progress that will undoubtedly evolve as

its operationalization proceeds and evidence accumulates on the link between health system organization and performance. The development of such a long-term agenda will help countries all over the world to articulate a better response to the complex and changing health needs of their populations.

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Reforma integral para mejorar el desempeño del sistema de salud en México*

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En todo el mundo, los países están innovando sus sistemas de salud como parte de la búsqueda continua de acceso universal, equidad, calidad y justicia en el financiamiento. En los últimos seis años, México ha avanzado en esta misma dirección. La actual reforma del sistema de salud está dirigida a los 50 millones de mexicanos no asegurados que habían sido excluidos de la seguridad social durante más de 60 años. La reforma estableció el Sistema de Protección Social en Salud (SPSS), el cual introdujo nuevas reglas para el financiamiento tanto de los servicios de salud pública y los servicios de salud dirigidos a la comunidad, como de los servicios personales de salud. Estos últimos se financian a través del Seguro Popular de Salud, el componente de aseguramiento subsidiado del SPSS que ofrece acceso gratuito en el momento de utilización de los servicios a un conjunto explícito de intervenciones de atención médica. En gran medida, la principal fuente de financiamiento proviene de impuestos federales y de contribuciones complementarias estatales. Las familias también realizan el pago anticipado de una pequeña prima definida de manera escalonada en función de su nivel de ingreso, de manera que el subsidio público es inversamente proporcional al ingreso familiar. El 20% más pobre de las familias está exento de esta contribución. La población susceptible de afiliarse incluye a todas las personas, en su mayoría pobres, que no son beneficiarias de la seguridad social, ya sea porque son autoempleados, desempleados o están fuera de la fuerza de trabajo. La mayor parte son pobres y muchas viven en familias encabezadas por mujeres. Esto significa que la pobreza y la situación laboral de las personas ya no son obstáculo para acceder a alguno de los seguros de salud que ofrecen las instituciones públicas. La ley que establece el nuevo sistema fue aprobada en abril de 2003 y entró en vigor el 1º de enero de 2004, con la meta de alcanzar la cobertura universal en materia de aseguramiento en salud en el año 2010.

Este trabajo, el primero de la serie sobre la reforma del sistema de salud mexicano, constituye una introducción a las principales características de esta reforma, y en esa medida proporciona antecedentes y evidencias para contextualizar los estudios analíticos y empíricos que le siguen. En Frenk[1] se presentó ya un panorama general de la lógica y resultados de la reforma mexicana. En el presente trabajo describimos esta experiencia con mayor profundidad. Primero se presenta una breve descripción del sistema mexicano de salud, que incluye el origen y la organización de sus principales instituciones. Después se discuten los retos que enfrentaba el sistema mexicano de salud antes de la reforma. En seguida se presentan los fundamentos éticos y la visión de la reforma. A continuación se describe la manera en que se han modificado tres de las funciones clave del sistema de salud: rectoría, financiamiento y prestación de servicios. Más adelante se

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resumen los avances de la reforma en sus tres primeros años de implantación y se identifican algunos de los retos futuros. El trabajo finaliza con una síntesis de las lecciones aprendidas del proceso de reforma, las cuales pueden ser útiles para otros países que buscan mejorar el desempeño de sus sistemas de salud.

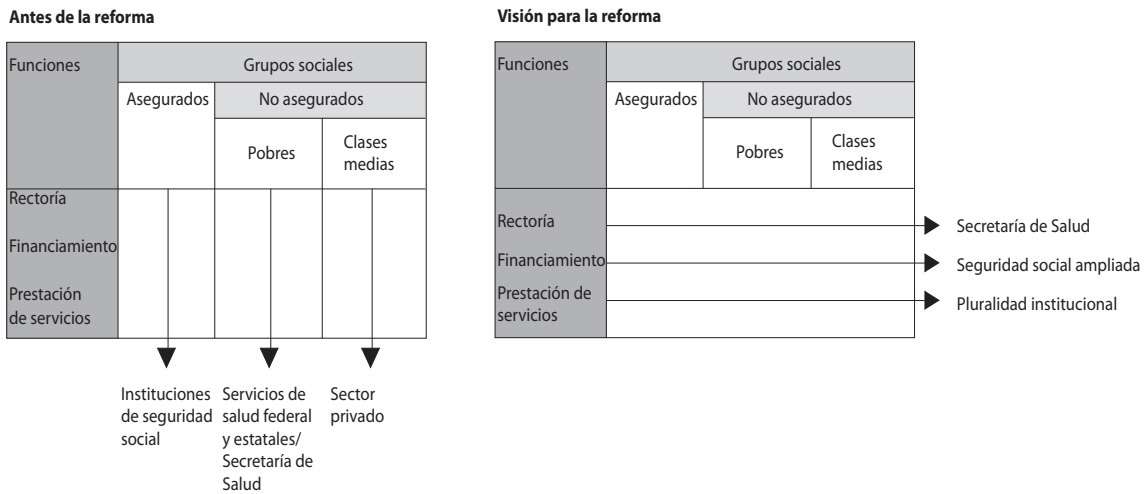
Antecedentes del sistema mexicano de salud

La fundación del sistema nacional de salud moderno data de 1943, año de creación de la Secretaría de Salud (SS), entonces Secretaría de Salubridad y Asistencia, y del Instituto Mexicano del Seguro Social (IMSS). En 1959, se crea el Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado (ISSSTE) para cubrir a los empleados del sector público y a sus familias.[2]

Durante este periodo, y hasta 2003, la población no cubierta por la seguridad social, principalmente la más pobre, era considerada como un grupo residual atendido por la SS con una fuente de financiamiento incierta y un paquete de beneficios mal definido. Esta población tenía acceso a unidades de servicios de salud operadas a nivel estatal y federal a cambio de un copago o cuota de recuperación en el momento de utilizar los servicios, que, a pesar de estar ajustada por el nivel de ingreso y contar con un subsidio significativo, contribuía a la alta proporción de gasto de bolsillo como fuente de financiamiento de la atención médica. La escasez de medicamentos en estas unidades médicas era común como resultado de limitaciones presupuestales y frecuentemente exponía a esta población a pagos de bolsillo adicionales. En contraste, el aseguramiento en salud en las instituciones de seguridad social garantiza el acceso gratuito a la atención a la salud en el momento de utilización de los servicios, y se financia con contribuciones de la nómina del empleador y del empleado, con una contribución adicional del gobierno federal que se financia a través de impuestos generales. En paralelo, existe un grupo heterogéneo y mal regulado de prestadores privados de servicios, muchos de ellos no certificados, que atendía y sigue atendiendo a las familias no aseguradas con capacidad de pago, y a la población que contaba con alguna seguridad social pero que estaba insatisfecha con la calidad de los servicios que ofrecían sus instituciones.

Es así que desde sus orígenes el sistema mexicano de salud ha estado organizado con base en un modelo segmentado, predominante en América Latina, marcado por la separación del derecho a la atención a la salud entre los asegurados del sector asalariado y formal de la economía y los no asegurados. Cada segmento de la población recibía los servicios de salud a través de instituciones integradas verticalmente, cada una de las cuales era responsable de la rectoría, el financiamiento y la prestación de servicios sólo para ese grupo de población (figura 1).[2-5]

Figura 1. Reorganización del sistema de salud mexicano



Fuente: Frenk J y colaboradores[3]

Hasta el año 2000, antes de la reforma, el IMSS atendía a todos los trabajadores asalariados del sector privado y a sus familias, que representaban aproximadamente 40% de los casi 100 millones de habitantes de México; el ISSSTE atendía a 7%, y los seguros privados cubrían de 3 a 4% de la población. En consecuencia, aproximadamente 50% de la población no tenía acceso a ningún tipo de seguro médico prepagado. Esto incluía a alrededor de 2.5 millones de familias de los segmentos más pobres que recibían únicamente intervenciones de salud comunitarias y preventivas muy básicas incluidas en el programa de combate a la pobreza denominado Oportunidades.[1]

En general, prácticamente toda la población tenía acceso a algún tipo de servicio de salud, pero el número, calidad, efectividad y grado de protección financiera de las intervenciones variaban sustancialmente entre grupos de población, y eran particularmente deficientes para los pobres.[6]

Retos enfrentados por la reforma

Al igual que la mayoría de los países de ingresos medios, México experimenta procesos interrelacionados de transición demográfica y epidemiológica. La tasa de fecundidad declinó significativamente de 6.8 nacidos vivos por mujer en 1960 a 2.1 en 2005. Durante el mismo periodo, la esperanza de vida aumentó de 57.5 a 75.4 años. En consecuencia, la estructura de la población ha cambiado dramáticamente. Mientras que el grupo de menores de cinco años ha disminuido en números absolutos desde 1994, se espera que el crecimiento del grupo de la población de 60 años y más aumente a un ritmo de 4% anual en la próxima década.[7,8]

Aun cuando la transición epidemiológica está bastante avanzada, el proceso ha sido tanto complejo como prolongado: aunque las infecciones comunes han disminuido rápidamente, no han sido del todo controladas, mientras que las enfermedades no transmisibles y las lesiones ya constituyen las principales causas de mortalidad y discapacidad.[1,9,10] Entre 1950 y 2000, la proporción de muertes atribuibles a enfermedades no transmisibles y lesiones aumentó de 44 a 73% y se espera que llegue a 78% en 2025. En contraste, la proporción atribuible a enfermedades transmisibles disminuyó abruptamente de 50% en 1950 a 14% en 2000, y se espera que siga disminuyendo hasta representar 10% en 2025.[11] En consecuencia, el sistema de salud se ha visto abrumado por la necesidad de enfrentar simultáneamente el rezago de las enfermedades transmisibles y los problemas de salud reproductiva que se concentran en la población más pobre y geográficamente dispersa, y por otro lado, el rápido incremento en la prevalencia de padecimientos no transmisibles y costosos que afectan a toda la población.

En 2000-2001, como parte del trabajo derivado del Programa Nacional de Salud actual, se identificaron cinco desequilibrios financieros como las principales limitantes que impedían que el sistema de salud respondiera a las necesidades de la población derivadas del desafío epidemiológico.[11] Estos desequilibrios se relacionan con: i) un bajo nivel del gasto general en salud; ii) el predominio del gasto de bolsillo; iii) una asignación desigual de los recursos públicos entre los asegurados y los no asegurados, y entre estados; iv) una contribución estatal desigual al financiamiento de los servicios de salud, y v) una insuficiencia crónica de inversión en infraestructura de salud.[2,11,12]

En primer lugar, el gasto total era insuficiente para un país con el nivel de desarrollo y la complejidad de necesidades de salud de México. En 2000, el país gastaba en servicios de salud sólo 5.6% del Producto Interno Bruto (PIB), alrededor de $ 350 dólares per cápita, cifra muy por debajo del nivel promedio de América Latina de casi 7%. En segundo lugar, a pesar de ser un medio ineficiente y desigual de financiar la salud, el gasto del bolsillo representaba la mayor parte del financiamiento total de la salud. Como se documenta en Knaul y colaboradores, en esta serie, dicha proporción es mayor que en muchos otros países con un nivel similar de desarrollo económico, y sustancialmente mayor que en países más desarrollados.[13-15] El tercer desequilibrio se refiere a la distribución inequitativa de los fondos públicos entre grupos poblacionales y entre estados. Aun cuando los no asegurados representaban 55% de la población, en 2002 recibieron 34% del financiamiento público federal para salud. Esto se traduce en un nivel promedio de gasto público per cápita 2.3 veces mayor para los asegurados que para los no asegurados. Asimismo, el gasto federal per cápita varía entre las 32 entidades en el orden de 5 a 1 entre el estado con mayor gasto y el estado con la menor asignación. Las diferencias entre las aportaciones estatales per cápita en el mismo año fueron todavía más dramáticas, en el orden de 115 a 1. Finalmente, el gasto en equipamiento y nuevas instalaciones representó cuando mucho 2% del gasto federal total para los no asegurados.[11-15]

La dependencia del gasto de bolsillo colocó a las familias ante el grave riesgo de empobrecimiento, como se discute en Knaul y colaboradores y Gakidou y colaboradores en esta serie.[13,16] De hecho, los análisis realizados por la Fundación Mexicana para la Salud (Funsalud) y la

Secretaría de Salud han mostrado que al año, entre dos y cuatro millones de hogares mexicanos ±la mayoría pobres y no asegurados± incurrían en gastos catastróficos (definidos como un porcentaje, por lo general 30%, del ingreso total de la familia una vez descontado el gasto en alimentos) y gastos empobrecedores por motivos de salud (se refiere al gasto que empuja el ingreso del hogar por debajo o más abajo de un umbral, por lo general medido en términos de una línea de pobreza).[17]

El origen de las evidencias sobre estos desequilibrios se remonta a mediados de la década de los noventa y demuestra la importante contribución realizada por las instituciones de investigación locales.[13,18] Esta capacidad local es el resultado de inversiones clave realizadas a lo largo de dos décadas para consolidar y ampliar la base del conocimiento en políticas de salud. Mediante el uso de diversas herramientas conceptuales y metodológicas desarrolladas por organizaciones académicas e internacionales, y gracias al trabajo con otras dependencias nacionales como el Instituto Nacional de Salud Pública, Funsalud construyó un sistema de cuentas nacionales de salud. El análisis realizado, dirigido hacia las políticas públicas, reveló la dependencia del gasto de bolsillo para financiar el sistema de salud. Estos hallazgos se reforzaron con la evaluación comparativa de los sistemas nacionales de salud, publicada como parte del Informe Mundial de la Salud de 2000, que identificó desigualdades sustanciales en el financiamiento de la salud en México.[19] Este resultado motivó análisis adicionales detallados en el ámbito nacional por parte de Funsalud y la Secretaría de Salud.[15,17]

En suma, el grueso de las evidencias derivadas de estos análisis nacionales e internacionales, junto con la creciente presión de las cambiantes necesidades de salud de la población y las limitaciones del actual sistema de salud, confirmaron la necesidad de emprender una reforma de fondo. La esencia de esta reforma es la creación del SPSS y su componente de aseguramiento médico, el Seguro Popular de Salud (en adelante Seguro Popular).

A lo largo del proceso de reforma, los argumentos para su defensa, generados por el trabajo analítico sobre el financiamiento de la salud, jugaron un papel clave. El uso de la evidencia se reforzó con la aplicación de un marco ético explícito. Por ejemplo, mostrar que la población asegurada recibía muchos más recursos públicos que los pobres no asegurados permitió argumentar que el sistema actual violaba el principio democrático relativo a la igualdad de derechos de todos los ciudadanos.

Fundamento ético

Incluso cuando la Constitución mexicana reconoció formalmente el derecho social a la protección de la salud hace dos décadas, en la práctica, no todas las personas habían tenido la misma capacidad para ejercerlo.[12] Como se indicó anteriormente, la mitad de la población, en virtud de su situación laboral, gozaba de la protección de la seguridad social y por lo tanto enfrentaba menos obstáculos al acceso a los servicios médicos que la mitad no asegurada.

Este tipo de segregación ocupacional es incompatible con la idea de que el acceso a la atención médica es un derecho humano, según lo estipula el Pacto Internacional de Derechos Económicos, Sociales y Culturales de Naciones Unidas. Mientras que México logró avanzar en el ejercicio de los derechos políticos y civiles como resultado de su proceso de democratización, resultaba claro que el siguiente gran reto era mejorar la desigualdad social mediante la garantía del ejercicio universal del derecho a los servicios de salud. En este contexto el término "universal" tiene dos significados: cubrir a todos y hacerlo sin ningún tipo de discriminación. Esto es especialmente importante para aquellos grupos que han sido excluidos de participar regularmente en el sector formal (por ejemplo trabajadores migrantes y hogares encabezados por mujeres). Éste fue el marco ético primordial en el cual se presentó la reforma.

La visión detrás de la reforma a la Ley General de Salud de 2003 es reorganizar el sistema de salud a través de la integración horizontal de sus tres funciones básicas: rectoría, financiamiento y prestación de servicios. Esta visión rompe con la situación previa a la reforma que fragmentaba el sistema verticalmente por grupos poblacionales (figura 1). Al contrario, la reforma se diseñó para reforzar el papel rector de la Secretaría de Salud.

Hasta la fecha, la reforma ha dado pasos importantes en esta dirección. En términos de rectoría, la reforma fortalece la función de la SS, la cual incluye el monitoreo, la evaluación del desempeño y la regulación de todo el sistema de salud. Asimismo, homogeneiza y hace universal el derecho de los ciudadanos al financiamiento público para la protección de la salud, y empodera a los consumidores para influir sobre la prestación de servicios de salud, a la vez que fortalece la oferta del sistema de salud. En seguida se describe la manera en que la reforma mexicana ha transformado estas tres funciones críticas de todo sistema de salud.[20,21]

Principales componentes de la reforma

Rectoría

La devolución y descentralización de la prestación de servicios de la SS hacia los estados se inició a mediados de la década de los ochenta y continuó a lo largo de la década de los noventa.[3] Este importante paso hizo posible enfocar la función rectora de la SS en la coordinación, regulación, monitoreo y evaluación. No obstante, este proceso debilitó los instrumentos que la SS podía movilizar de manera efectiva para dirigir el sistema y alinear los incentivos.

Uno de los resultados clave de la reforma de 2003 fue fortalecer la función rectora de la SS a través de la generación de instrumentos para orientar los flujos financieros y vincular las asignaciones del lado de la oferta con los incentivos del lado de la demanda. Estos instrumentos incluyen reglas explícitas para las transferencias financieras del nivel federal al nivel estatal, el establecimiento de prioridades a través de un paquete de servicios esenciales y la certificación de la infraestructura de salud. Los incrementos presupuestales asociados con la reforma se manejan con estas herramientas para realinear los incentivos y, en consecuencia, corregir muchos de los desequilibrios financieros arriba descritos. Dichos instrumentos se exponen en esta serie en los trabajos de González-Pier y colaboradores, y Lozano y colaboradores.[9,22]

Los resultados de dos décadas de inversión para generar evidencia fueron clave para fortalecer la capacidad rectora de la SS, así como para orientar la reforma. La consolidación de instituciones públicas, como el Instituto Nacional de Salud Pública, y la creación de instancias no gubernamentales, como Funsalud, aproximadamente 20 años antes de la reforma, permitieron establecer una base institucional a partir de la cual fue posible generar encuestas, realizar análisis y capacitar a los formuladores de políticas.

El papel mismo de las evidencias como guía de las políticas se fortaleció como parte de la reforma. Por ejemplo, la reforma exigió la creación de un sistema de información integral sobre las familias afiliadas al Seguro Popular. Este sistema es operado por la SS y se utiliza como padrón para identificar el nivel de aportaciones de cada familia, con el fin de garantizar la transparencia en la asignación de recursos, y como herramienta gerencial que proporciona información sobre la utilización de servicios y sus resultados.

La reforma también está expandiendo la naturaleza y el horizonte del monitoreo y la evaluación. Desde 2001 se han publicado anualmente informes comparativos que hacen uso de indicadores del desempeño en los niveles sistémico, estatal, institucional y hospitalario.[14,23-26] Estos indicadores utilizan las técnicas más avanzadas de que se dispone actualmente, junto con datos de encuestas a profundidad diseñadas específicamente para el sistema de salud mexicano. El informe de indicadores al nivel estatal ofrecerá un punto de referencia para la población sobre el funcionamiento del sistema y presionará a las instituciones para desempeñarse mejor.

La reforma misma está siendo sometida a una evaluación externa, rigurosa y de largo plazo, utilizando un diseño experimental que medirá con detalle el impacto del Seguro Popular sobre las condiciones de salud, la cobertura efectiva, la capacidad de respuesta del sistema de salud y la protección financiera. Con este fin, desde 2005 se han llevado a cabo encuestas longitudinales, diseñadas específicamente para medir los avances de la reforma. El primer conjunto de resultados se dará a conocer a finales de 2006. Los trabajos de Gakidou y colaboradores y Lozano y colaboradores, incluidos en esta serie, utilizan estos datos y presentan resultados que forman parte del proceso de evaluación.[16,22]

Diversos proyectos y programas sustantivos e instrumentales para mejorar la cobertura, la equidad y la calidad de los servicios de salud se están alineando como parte de la creación del Seguro Popular. Un ejemplo es la Cruzada Nacional por la Calidad de los Servicios de Salud lanzada en 2001 para mejorar la calidad técnica e interpersonal de la atención médica. Esto incluye la definición de los derechos de los pacientes y la introducción de mecanismos para la presentación tanto de quejas como de sugerencias sobre cómo mejorar los servicios.

Históricamente, las dependencias de salud del sector público han operado como monopolios que cuentan con un margen muy reducido para la elección del prestador del servicio, y muestran poco interés por satisfacer las expectativas del consumidor o mejorar la calidad de los servicios. Asimismo, pocos centros públicos o privados estaban sujetos a un proceso formal de acreditación. En este sentido, la cruzada representa una ruptura con el pasado. Está diseñada para resolver estos problemas concentrándose en mejorar los estándares de calidad de la atención, al tiempo que fortalece la capacidad de los ciudadanos para demandar la rendición de cuentas. El impulso para promover la calidad incluye un proceso de acreditación, reforzado por el hecho de que sólo los prestadores de servicios

acreditados pueden participar en el Seguro Popular. Adicionalmente, se han diseñado e implantado indicadores para monitorear la calidad. Estos incluyen los tiempos de espera en hospitales y clínicas, así como indicadores sobre la distribución y surtimiento de medicamentos. Asimismo, en la mayoría de los estados se han establecido comisiones de arbitraje, con el fin de responder oportunamente a la expansión de las demandas por mala práctica médica.[27]

Algunas instituciones específicas dentro del sector salud también se han fortalecido para poder desempeñar mejor su función rectora. En algunos casos esto significó definir nuevas funciones para entidades ya existentes; en otros implicó desarrollar nuevas entidades. Uno de los ejemplos más importantes es el Consejo de Salubridad General, una antigua institución creada en 1910 como organismo formulador de políticas del más alto nivel dentro del sector salud. Encabezado por el Secretario de Salud, el Consejo incluye a los titulares de todas las instituciones públicas de salud del país, a expertos destacados en el campo de la salud, a organizaciones civiles y asociaciones profesionales, y al sector privado. Actualmente el Consejo es responsable de un elemento clave del proceso de definición de prioridades: la definición de las enfermedades y, por ende, los tratamientos y medicamentos correspondientes que habrán de ser considerados para cobertura por el Fondo de Protección contra Gastos Catastróficos.

En el ámbito de la regulación, en 2001 se creó la Comisión Federal para la Protección contra Riesgos Sanitarios. Esta dependencia reguladora semiautónoma opera de manera independiente de la SS con un enfoque tanto interinstitucional (dentro del sector salud) como intersectorial, para lograr una mejor coordinación. La Comisión reglamenta productos y servicios críticos, como los productos farmacéuticos y las tecnologías de salud, los riesgos ocupacionales y ambientales, el saneamiento básico, la inocuidad alimentaria y la publicidad relacionada con la salud. Es de particular importancia su función en la regulación e inspección de hospitales y clínicas, ya que está obligada a clausurar a los prestadores de servicios que no cumplan con las normas básicas de calidad.

Financiamiento

La lógica que subyace a la reforma es separar el financiamiento entre los bienes públicos de la salud y los servicios personales de salud (cuadro I). Esta separación del financiamiento está diseñada para proteger las actividades de salud pública, que tienden a estar subfinanciadas en las reformas que se sustentan en subsidios a la demanda para los servicios personales de salud.[28] Los bienes públicos de salud incluyen la función de rectoría (planeación estratégica, información, evaluación, investigación y desarrollo de recursos humanos), así como los servicios de salud comunitaria. Las funciones de rectoría se financian a través del presupuesto de la SS. El nuevo Fondo de Aportaciones para los Servicios de Salud a la Comunidad se usa para financiar exclusivamente las actividades de salud pública proporcionadas en los niveles federal y estatal.[2,29]

El financiamiento de los servicios personales de salud se basa en una lógica de aseguramiento que permite proteger a los pacientes contra la incertidumbre financiera asociada con la enfermedad. El Seguro Popular divide los servicios personales de salud en un paquete esencial de intervenciones de primer y segundo nivel, que se proporcionan en el contexto de la atención ambulatoria y en hospitales generales, y un paquete de intervenciones de alto costo de tercer nivel, financiadas a través del Fondo de Protección contra Gastos Catastróficos (FPGC). La prestación del paquete esencial de intervenciones se ha descentralizado al nivel estatal, ya que se trata de intervenciones que se asocian con eventos de salud de bajo riesgo y alta probabilidad. En contraste, las intervenciones de alto costo de tercer nivel requieren de un fondo que mancomune el riesgo al nivel nacional, así como de unidades regionales o nacionales que ofrezcan servicios de alta especialidad financiados por el FPGC.[2,9,29]

El Seguro Popular ofrece protección financiera en materia de salud a los mexicanos que no cuentan con ningún tipo de seguro público de salud. Su estructura financiera se basa en una lógica tripartita de derechos y responsabilidades que es similar a la de las dos dependencias de seguridad social más importantes ±IMSS e ISSSTE (cuadro II)±. Esta estructura garantiza solidaridad y corresponsabilidad entre los diferentes órdenes de gobierno y las familias. La estructura financiera tripartita del Seguro Popular incluye aportaciones de tres fuentes: el gobierno federal, un contribuyente corresponsable y el beneficiario.[2,29]

El primer componente es la contribución social o cuota social, la cual es una aportación fija por familia financiada totalmente por el gobierno federal con ajustes periódicos de acuerdo a la inflación. Se basa en el principio ético del derecho universal de acceso a los servicios de salud y por lo tanto es igual para todas las familias mexicanas. Esta contribución garantiza la distribución equitativa de los recursos federales y, en consecuencia, la solidaridad entre todos los grupos po-

Cuadro I. Relación entre tipos de bienes y fondos en el Sistema de Protección Social en Salud, México

Tipo de bien	Bienes de la salud	Fondo
Bienes públicos de salud	Rectoría	Presupuesto de la Secretaría de Salud
	Información, evaluación, investigación, desarrollo de recursos humanos	
	Servicios de salud a la comunidad	Fondo de Aportaciones para los Servicios de Salud a la Comunidad
Servicios personales de salud (Seguro Popular)	Servicios esenciales de salud (atención de primer y segundo nivel)	Fondo para Servicios Personales de Salud
	Servicios de salud de tercer nivel de alta especialización asociados con gastos catastróficos	Fondo de Protección Contra Gastos Catastróficos

Cuadro II. Contribuciones para financiar la protección social universal en salud, México

Esquema de aseguramiento público	Contribuciones		
	Beneficiario	Contribuyente corresponsable	Gobierno Federal
IMSS (empleados asalariados del sector privado)	Empleado	Empleador privado	Contribución social
ISSSTE (empleados asalariados del sector público)	Empleado	Empleador público	Contribución social*
Seguro Popular (empleados no asalariados, trabajadores independientes, y familias fuera de la fuerza de trabajo)	Familia	Contribución solidaria: Gobierno estatal/Gobierno federal	Contribución social

* En el caso del ISSSTE, la contribución social todavía no se establece, ya que los cambios legislativos que se requieren están en desarrollo

blacionales dado que los fondos federales provienen de los impuestos generales.

El segundo elemento es la contribución corresponsable, que garantiza la solidaridad dentro de cada grupo poblacional y la redistribución entre estados. En el IMSS esta aportación proviene del patrón y en el ISSSTE del gobierno en su calidad de empleador. En el caso del Seguro Popular, dado que no hay empleador, la corresponsabilidad se establece entre los gobiernos federal y estatal para subsanar las enormes diferencias entre los niveles de desarrollo de los estados. La aportación solidaria federal es, en promedio, 1.5 veces la contribución social, pero se incrementa para los estados más pobres a expensas de los más ricos. La aportación solidaria estatal es igual para todos los estados y asciende a la mitad de la contribución social federal. La fuente de financiamiento son los recursos provenientes de los ingresos estatales.[2,29]

El tercer componente es la contribución familiar, que es progresiva y redistribuye el ingreso familiar. En el caso del IMSS y el ISSSTE, la aportación del empleado se deduce de la nómina. En el Seguro Popular el monto de la aportación se basa en un subsidio escalonado con base en el principio de que ninguna familia debería tener que aportar una cantidad mayor a la proporción justa en función de su capacidad de pago. Para promover la justicia financiera, la capacidad de pago se define en términos del ingreso disponible que, a su vez, se define como el gasto total del hogar menos el gasto en alimentos. Las familias de los dos deciles de ingresos más bajos no realizan aportaciones financieras, pero su afiliación está condicionada a su participación en actividades de promoción de la salud. Para los demás deciles de ingreso, la aportación de la familia es una proporción fija e igual del ingreso disponible y el límite superior es 5%. Para cada decil del

tercero al noveno se definió una aportación nominal, y se establecieron dos niveles de aportación para el décimo decil debido a la amplia variación en la parte superior de la distribución del ingreso.

Este esquema financiero incluye varios fondos etiquetados. El más grande de ellos es el FPGC, que equivale a 8% de la contribución social federal más las aportaciones solidarias federal y estatal. Un 2% adicional está dirigido a las inversiones en infraestructura en comunidades pobres. Un fondo de reserva que equivale a 1% del total está diseñado para cubrir las fluctuaciones inesperadas de la demanda y los pagos temporalmente vencidos de la utilización interestatal de servicios. Estos tres fondos se administran a nivel federal para garantizar la adecuada mancomunación de riesgos. El resto de las aportaciones se asigna a los estados para financiar el paquete esencial de servicios de salud. La totalidad de las contribuciones familiares permanece en el estado que las recolectó.

Este modelo de financiamiento implica un cambio importante en los incentivos para los gobiernos estatales y los prestadores de servicios. Ahora el financiamiento para los estados se basa en una fórmula y ésta, a su vez, está determinada en gran parte por el número de familias afiliadas al Seguro Popular y, por ende, por la demanda. En el pasado los presupuestos estatales de salud eran asignados por el gobierno federal y estaban determinados en gran parte por la inercia histórica y el tamaño de la nómina del sector salud. Como consecuencia de la reforma, la "presupuestación burocrática", orientada a satisfacer las demandas de los prestadores de servicios, está siendo gradualmente reemplazada por lo que se ha denominado "presupuestación democrática", que garantiza que el dinero siga a la gente. La fórmula también incluye un componente de desempeño y un componente de progresividad para compensar gradualmente las diferencias entre los estados.[2,29]

La afiliación es voluntaria. Sin embargo, la reforma incluye incentivos para ampliar la cobertura. Los estados tienen el incentivo de afiliar a toda la población porque su presupuesto se basa en un pago anual por familia. La naturaleza voluntaria de la afiliación es un componente clave del proceso, ya que genera incentivos para equilibrar la calidad y la eficiencia: si los estados ofrecen una atención dispendiosa, el dinero recibido no será suficiente para satisfacer la demanda, pero si la calidad es baja, las familias no se reafiliarán.[2,29]

Prestación de servicios

Los servicios para los afiliados al Seguro Popular se contratan en su mayor parte, pero no exclusivamente, con prestadores públicos que predominantemente forman parte de las 32 secretarías estatales de salud. Se han diseñado varias iniciativas para fortalecer la oferta de servicios de salud de alta calidad. Dentro de ellas destacan los tres planes maestros de infraestructura, equipamiento y recursos humanos.[29]

En el caso de la infraestructura, el plan maestro fue diseñado para proporcionar un marco de largo plazo para ampliar la disponibilidad y capacidad de las unidades que ofrecen servicios de salud. Antes de la reforma había pocos incentivos para invertir en infraestructura y el financiamiento disponible era escaso. La reforma contrarresta este problema mediante el aumento de la inversión pública en servicios de salud durante siete años. Dicho aumento está alineado con la afiliación, ya que los estados tienen el incentivo de atender a la población afiliada al Seguro Popular en tanto su presupuesto está ligado a los niveles de afiliación. En vista de que las etapas iniciales de la afiliación se enfocaron en los segmentos más pobres de la población, las prioridades en términos de las inversiones de capital se relacionan con esas familias y, en consecuencia, son altamente progresivas. Para maximizar la eficiencia, el financiamiento para las unidades nuevas ±clínicas, centros de salud, hospitales de segundo nivel y hospitales de especialidades de tercer nivel± se basa en la determinación de necesidades realizada por el estado en cada localidad. Para 2006 se habrán construido 1 792 nuevas unidades de salud, que incluyen cuatro hospitales regionales de alta especialidad en la región sur, la menos desarrollada del país.

Un complemento del plan maestro de infraestructura es el plan de inversión en equipamiento médico, diseñado e implementado por el Centro Nacional de Excelencia Tecnológica en Salud (Cenetec), de reciente creación. Este plan refuerza los procedimientos de mantenimiento del equipo médico y racionaliza la adopción de nuevas tecnologías a través de la valoración de necesidades basadas en evidencias.

Finalmente, el plan maestro de inversión en recursos humanos se enfoca en el desarrollo de las capacidades médicas y de enfermería necesarias para satisfacer las cambiantes demandas asociadas con la transición epidemiológica y para equilibrar un mercado de trabajo médico que presenta,

al mismo tiempo, problemas de desempleo urbano y escasez de dichos recursos en las áreas rurales.[30] Este plan incluye un diagnóstico exhaustivo por estado de la oferta de médicos, enfermeras y otros trabajadores de la salud en las instituciones públicas. A partir de esta información se hacen proyecciones de mediano plazo de la oferta y se emiten recomendaciones en materia de desarrollo de recursos humanos, tanto para las instituciones educativas como para los prestadores públicos de servicios.

Junto con los tres planes maestros se han desarrollado otras herramientas para mejorar la prestación de servicios. Destacan dentro de ellas las cartillas de salud diseñadas para facilitar la prevención y la detección temprana de enfermedades en grupos específicos de edad y sexo. Se ha puesto particular énfasis en las intervenciones relacionadas con las Metas de Desarrollo del Milenio, incluida la salud neonatal e infantil, como es analizada por Sepúlveda y colaboradores en otro artículo de esta serie.[31,32] Asimismo, se han obtenido resultados importantes en la prevención y control del VIH/SIDA. Las tarjetas de salud han sido muy útiles para el manejo de enfermedades crónicas no transmisibles y factores de riesgo como la obesidad, diabetes, hipertensión y cáncer. Los programas de detección temprana de cáncer cervicouterino y cáncer de mama están teniendo resultados alentadores, como se menciona en Gakidou y colaboradores en esta serie.[16]

La herramienta clave que articula los incentivos del lado de la oferta y de la demanda es el paquete de servicios cubiertos. De acuerdo con la Ley, el paquete esencial debe incluir atención ambulatoria y hospitalaria para las especialidades básicas (medicina interna, cirugía general, ginecología y obstetricia, pediatría y geriatría). A partir de 2006, el paquete de servicios esenciales incluye 249 intervenciones, mientras que el FPGC financia 17 intervenciones más.

El proceso de definición del paquete es dinámico. La ley estipula que debe ampliarse progresivamente y actualizarse cada año con base en los cambios en el perfil epidemiológico, los avances tecnológicos y la disponibilidad de recursos. Esto significa que la cobertura de beneficios se amplía con el tiempo a medida que se cuenta con nuevas tecnologías y mayores recursos, y también conforme se identifican nuevas enfermedades. Los servicios cubiertos se analizan y eligen con base en las evidencias derivadas de estudios de costo-efectividad y también con base en la deliberación ética de criterios de aceptabilidad social. El uso de este enfoque se ilustra en los trabajos de González-Pier y colaboradores, y Lozano y colaboradores en esta serie.[9,22]

La noción de un paquete de servicios de salud, además de servir de herramienta para la definición de prioridades desde el punto de vista de la rectoría, es un medio para empoderar a las personas al hacer explícitos sus derechos. De igual modo, es un instrumento clave de planeación para orientar a los prestadores de servicios y una guía para la acreditación, puesto que define los servicios de salud que cada prestador debe ofrecer ahora y en el futuro. En otras palabras, la definición del paquete y la organización del proceso de acreditación de los prestadores en torno a él generan las condiciones para que el sistema realmente proporcione las intervenciones específicas que, de acuerdo con las evidencias disponibles, producen los mayores beneficios de salud dado un determinado nivel de recursos.

Avances y retos futuros

La reforma está produciendo resultados positivos: el monto de los recursos públicos dedicados a la salud ha aumentado significativamente; se espera que el número de familias aseguradas llegue a 5.1 millones para fines de 2006, de acuerdo con el mandato legal de afiliar cada año a 14% de la población no asegurada, y el conjunto de servicios médicos a los que cada familia con cobertura tiene acceso se ha ampliado de manera considerable.

Evolución de los desequilibrios financieros

El gasto total en salud en México, expresado como porcentaje del PIB, creció de 6.2% en 2002 a 6.5% en 2006 (cuadro III). De hecho, entre 2001 y 2006 el presupuesto de la SS aumentó 69% en términos reales. La mayor parte de este aumento es consecuencia directa de la movilización de recursos públicos adicionales vinculados con la reforma. Sobre esta base se espera que el gasto público en salud siga aumentando a un ritmo mayor que el gasto privado. Así, se espera que para 2010 el sistema mexicano de salud esté financiado, en su mayor parte, con fondos públicos. Esto se basa en los resultados presentados por Knaul y colaboradores en esta serie, que muestran la constante reducción de los gastos catastróficos y empobrecedores en salud desde la crisis económica de 1994-1996.[13] Aun cuando parte de esta mejoría se atribuye a la recuperación económica y al combate a la pobreza por medio de programas sociales como Oportunidades, existe evidencia descriptiva sustancial que sugiere que también se asocia con la expansión del Seguro Popular y las inversiones concomitantes para fortalecer la prestación de servicios.[1]

Cuadro III. Evolución de los desequilibrios financieros que exigían una reforma integral en México

	Indicador	2002	Avance
Nivel	Gasto en salud como % del PIB	6.2%	6.5% (2006‡)
Fuente	Gasto público en salud como % del gasto total en salud	43.9%	46.4% (2006‡)
Distribución	Número de veces que el gasto público per cápita para la población asegurada excede el gasto público per cápita para la población no asegurada*	2.3	2.0 (2006‡)
	Relación entre el gasto federal per cápita en salud en el estado con la cifra más alta y el estado con la cifra más baja	5 a 1	4 a 1 (2004)
Contribución estatal	Variabilidad en la contribución de los estados al financiamiento de los servicios de salud (coeficiente de variación)	1.14	1.11 (2004)
Distribución de recursos	Relación entre el gasto en nómina y la inversión en infraestructura	59 a 1	7 a 1 (2006‡)

* Incluye el gasto federal y estatal
‡ Cifras estimadas basadas en datos presupuestales

El aumento del financiamiento público también está cerrando la brecha en términos de las asignaciones per cápita entre la población sin seguridad social (incluidos los afiliados al Seguro Popular) y la población cubierta por la seguridad social. En el periodo 2002-2006 la relación entre el gasto público per cápita entre ambos grupos disminuyó de 2.3 a 2.0 y continuará declinando con la expansión legislada del Seguro Popular.

Las inequidades en la distribución de los recursos públicos entre los estados también se han reducido. En los últimos cuatro años la diferencia en las asignaciones federales per cápita entre el estado que recibió la mayor asignación y el que recibió la menor disminuyó de 5 a 4 veces. En el mismo periodo, la desigualdad en las contribuciones estatales para financiar la salud también disminuyó, como lo muestra el coeficiente de variación, que se redujo ligeramente, de 1.14 en 2002 a 1.11. Finalmente, la proporción de recursos públicos asignados a la inversión en infraestructura se incrementó.

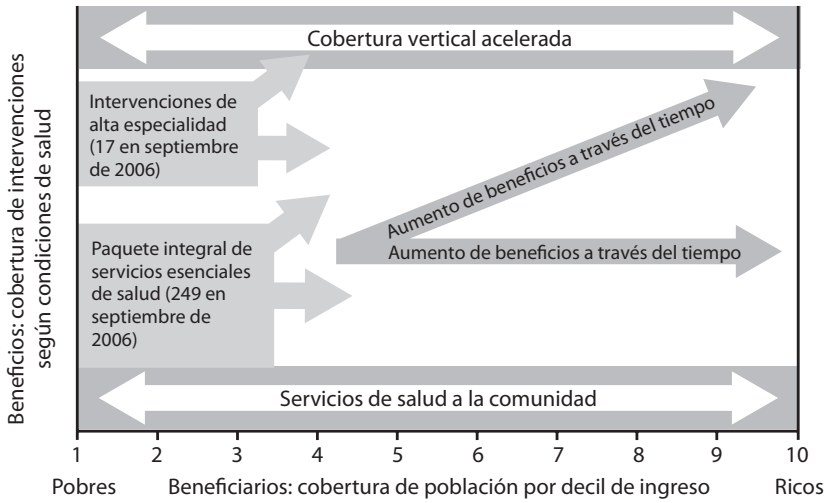
Cobertura

Este nuevo escenario financiero ha hecho posible aumentar la cobertura del Seguro Popular en dos dimensiones: horizontal y vertical. La primera se relaciona con el número de familias afiliadas; la segunda se refiere a los beneficios que cubre (figura 2). Estos últimos se analizan en González-Pier y colaboradores en esta serie.[9]

La cobertura horizontal se está expandiendo mediante la aplicación de criterios para promover la equidad y la justicia, ya que la afiliación se inició entre los grupos más pobres de la población y se está extendiendo gradualmente hacia los de mayores ingresos. La ley define el plan de cobertura horizontal. Para 2010, 100% de la población actualmente no asegurada (12 millones de familias) deberá estar afiliada. Por lo tanto, aproximadamente 1.7 millones de familias adicionales deben ser cubiertas cada año. Entre 2001 y 2003, antes de la reforma legal, el Seguro Popular operaba como un programa piloto que afilió a 614 000 familias. Desde entonces, la expansión de la cobertura se ha dado según lo programado y para septiembre de 2006 se habrán afiliado cuatro millones de familias ±el equivalente a casi 15 millones de personas±. Esto significa que el Seguro Popular ya es el segundo seguro de salud más grande del país. La mayoría de las familias afiliadas pertenecen a los dos deciles de ingresos más bajos y, en consecuencia, no se les exige el pago de una contribución familiar.

La expansión geográfica se ha dado en función del momento en que cada estado introdujo el nuevo sistema, la rapidez con que cada estado ha podido cubrir a los determinados grupos poblacionales y la disponibilidad de recursos adicionales. Desde principios de 2005 los 32 estados de México participan en el Seguro Popular. En términos de progresividad, en el año 2000 sólo 7% de las familias del quintil más pobre estaban aseguradas

Figura 2. Estrategias de la cobertura horizontal y vertical en el sistema de protección social en México



(primordialmente a través del IMSS o ISSSTE). Para 2004 esta cifra había aumentado a 37% a medida que las familias de este grupo se afiliaron al Seguro Popular.[1,26]

La cobertura vertical se está ampliando con base en prioridades explícitas en materia de intervenciones, como se indicó anteriormente. Los servicios actualmente cubiertos representan una expansión significativa respecto a la situación previa a la reforma y un avance constante a partir de 2003. Actualmente, el paquete de servicios esenciales cubre aproximadamente 95% de todas las causas de hospitalización, y 17 intervenciones de alta complejidad son cubiertas a través del FPGC. Este último también prevé un esquema especial de cobertura universal acelerada para problemas de alta prioridad considerados como las principales causas de gasto catastrófico para las familias previamente no aseguradas, incluyendo terapia integral de SIDA, tratamiento de cánceres infantiles, tratamiento de cáncer cervicouterino en todas sus fases y extracción de cataratas. Mediante el esquema de cobertura acelerada, toda persona no asegurada que requiera de los servicios cubiertos es susceptible de afiliación inmediata al Seguro Popular. Las intervenciones cubiertas a través de los esquemas gradual y acelerado se ampliarán continuamente a medida que los recursos aumenten conforme se incremente el número de familias afiliadas.

Retos futuros

Aunque la reforma ha logrado avances, aún persisten varios retos. En primer lugar, se requieren recursos públicos adicionales tanto para continuar remplazando el gasto del bolsillo, como para satisfacer la costosa demanda asociada con la transición epidemiológica, especialmente de intervenciones hospitalarias de alta complejidad. Esto comenzará a cerrar la brecha entre México y otros países de la OCDE y la región latinoamericana, en los cuales una mayor proporción del gasto en salud se financia con recursos públicos.[6] Aunque algunos recursos serán liberados con el aumento de la eficiencia resultado de los incentivos integrados en la reforma, el monto absoluto y la proporción del PIB dedicada a salud proveniente de recursos públicos debe aumentar para que el sistema de salud responda efectivamente a las demandas de la población, alcance la cobertura universal del aseguramiento en salud, y expanda el número de intervenciones a las que tienen derecho las familias afiliadas. También será necesario continuar mejorando la distribución de los recursos públicos entre poblaciones y estados, y garantizar un compromiso presupuestal sostenido por parte de las autoridades locales. Otro reto en materia financiera será alcanzar el equilibrio correcto entre las inversiones adicionales en promoción de la salud y prevención de enfermedades, por un lado, y en servicios personales de salud, por el otro.

Además de una mayor cantidad de recursos, la persistente fragmentación institucional todavía representa un reto para promover una estructura general de financiamiento del sistema mexicano de salud más equitativa. Desde esta perspectiva, se requieren nuevos pasos que promuevan la integración de las fuentes públicas de financiamiento a través de los esquemas de protección social

existentes, con el fin de garantizar una mancomunación adecuada de los riesgos en el ámbito nacional, especialmente para la atención altamente especializada de tercer nivel.

Aumentar la orientación al cliente y la capacidad de respuesta del sistema de salud constituyen un tercer reto, especialmente considerando las crecientes expectativas, tanto de pacientes como de prestadores de servicios, generadas por el proceso de democratización del país y por la reforma misma. Para reafiliarse al Seguro Popular y estar dispuestos a hacer una contribución financiera anticipada, los ciudadanos deben sentir mayor confianza en los servicios públicos, y esto sólo puede lograrse si el sistema de salud es capaz de satisfacer efectivamente sus necesidades de salud. Para lograr esta meta es necesario seguir mejorando las siguientes áreas: la calidad técnica de la atención, la disponibilidad de medicamentos, la capacidad de elección del prestador de atención médica, el acceso a la atención durante las noches y fines de semana, y los tiempos de espera tanto para la atención ambulatoria y de emergencia, como para las intervenciones electivas.

Otro reto es desarrollar un ambiente más competitivo entre los prestadores de servicios. Muy probablemente los intereses creados relacionados con el poder monopólico en la prestación de servicios de salud dentro del sector público se verán amenazados con la nueva ley, la cual incrementa la capacidad de elección de los pacientes. Sin embargo, en el largo plazo este ambiente competitivo ayudará a alcanzar el equilibrio correcto entre calidad y eficiencia.

Finalmente, uno de los principales desafíos de la reforma mexicana será extender las innovaciones adoptadas por la SS hacia las instituciones de seguridad social. Esto incluye la separación efectiva entre el comprador y el prestador de servicios, y el incremento de la capacidad de elección de los pacientes. A su vez, las innovaciones recientes en la organización de los prestadores y las mejoras en las prácticas administrativas introducidas por el IMSS deben extenderse al resto del sistema. La homologación de las reglas de financiamiento y la adopción de estándares de calidad similares en todas las dependencias públicas podría gradualmente derribar los obstáculos institucionales existentes y abrir la puerta a un sistema más eficiente.

Lecciones

La experiencia de la reforma mexicana de salud ofrece un conjunto de lecciones potencialmente relevantes para otros países que están considerando realizar reformas de la salud en escenarios de desafío similares. La mayoría de los países en desarrollo enfrentan la apremiante combinación de una rápida transición epidemiológica con un sistema de salud subfinanciado y abrumado que es incapaz de responder a las circunstancias. En este contexto, es necesario diseñar e implementar propuestas de reforma integrales basadas en los tres pilares de las políticas públicas: ético, técnico y político.[18,33]

Por lo que se refiere al primer pilar, la reforma mexicana se formuló y promovió sobre la base de un conjunto de valores y principios explícitos relacionados con la idea de que la atención de la salud no es una mercancía o un privilegio, sino un derecho social. El ejercicio de este derecho puede mejorar las condiciones de salud de la población, el capital humano de las personas y los hogares, y la situación de pobreza del país. Este razonamiento resulta particularmente atractivo dado el proceso de democratización que experimentan muchos países en desarrollo y economías en transición.[34]

El pilar técnico es producto de una inversión de largo plazo en el desarrollo institucional y de recursos humanos, y el uso de bienes públicos globales relacionados con el conocimiento que se adaptaron al contexto mexicano. Entre estos bienes se incluyen los marcos conceptuales (por ejemplo, el marco de la OMS para el Desempeño de los Sistemas de Salud), los métodos estandarizados (por ejemplo, las encuestas de ingresos y gastos de hogares), y las herramientas analíticas (por ejemplo, las cuentas nacionales de salud). La inversión en recursos humanos durante un lapso de dos décadas hizo posible adaptar los conocimientos generados en todo el mundo y recabar evidencias que apoyaran una transformación profunda del sistema de salud. Estas evidencias empoderaron a los formuladores de políticas mexicanos en sus discusiones tanto con la Secretaría de Hacienda como con el Congreso, y guiaron el diseño, implementación y evaluación de la reforma.[1]

El pilar político se refiere al desarrollo de consensos para lograr objetivos compartidos. La reforma mexicana se benefició del concepto de que la salud es una aspiración de todas las fuerzas políticas y, por ende, puede generar acuerdos amplios y ayudar a incrementar la cohesión social. El énfasis en principios democráticos ±transparencia, rendición de cuentas y empoderamiento de los ciudadanos± también ayudó a generar el apoyo requerido y a consolidar la muy necesaria participación pública en todos los problemas relacionados con la atención de la salud. En términos del proceso político, resultó esencial la partici-

pación temprana de los actores clave en la discusión de la reforma, una vez que se definieron los cambios necesarios y se identificaron las opciones de política. Esto significó llevar a cabo campañas intensivas de consulta en todo el país para hacer conciencia y debatir sobre la reforma. Siempre que fue posible, se buscó conciliar los intereses de los sectores público y privado; de las autoridades federales, estatales y locales, así como de los grupos de interés, los sindicatos, los legisladores y los formuladores de política, para alcanzar cierto grado de consenso alrededor de un tema tan sensible como la salud. Finalmente, la estrategia de introducción de la reforma se organizó bajo un enfoque gradual. Esto dio el tiempo necesario para generar aceptación política y para desarrollar la capacidad de respuesta de la oferta de servicios a nivel local. La implementación del Seguro Popular se ha sustentado en la priorización de grupos de población, estados y localidades para generar un equilibrio justo entre la rapidez, percepción y progresividad de la respuesta de la oferta que se ha enfocado en los pobres. Más aún, la extensión del Seguro Popular se ha realizado utilizando una selección de municipios y estados para atender a los más pobres, pero también para hacerlo sin sesgo político alguno. Como resultado del esfuerzo significativo para aumentar el grado de conciencia mediante el uso de evidencias, la reforma ha logrado ser reconocida como un objetivo compartido por todas las partes involucradas y en todas las regiones. Esto ha facilitado en gran medida la negociación anual con el Congreso para buscar las asignaciones presupuestales necesarias cada año a fin de lograr las metas de afiliación.

La evidencia, como aquella presentada en cada uno de los trabajos de esta serie, fue un elemento crucial tanto para desarrollar el modelo ±el trabajo técnico±, como para promover la legislación y obtener el financiamiento ±el trabajo político±. Así, el uso de las evidencias continuará siendo un elemento esencial para mantener el ímpetu de la reforma. En ese sentido, la experiencia mexicana ofrece un modelo conceptual y práctico que busca alcanzar el objetivo tan evasivo de la cobertura universal, de manera que cada persona tenga igual oportunidad para ejercer su derecho a una atención médica de alta calidad con protección social para toda la población.

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Aumento de la sobrevida en menores de cinco años en México: la estrategia diagonal*

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A pesar de las reducciones significativas en mortalidad infantil en los países de ingresos bajos y medios a finales del siglo XX, siguen muriendo más de 10 millones de niños menores de cinco años cada año, casi todos por causas prevenibles: diarrea, neumonía, sarampión, paludismo, VIH/SIDA, la causa subyacente de la desnutrición y varias causas más que producen muertes en neonatos.[1,2] El Informe de 2005 sobre el cuarto objetivo de Desarrollo del Milenio (MDG4) es sombrío, ya que muestra que ha disminuido el progreso para reducir la mortalidad en menores de cinco años en todo el mundo. Entre 1960 y 1990, las tasas de reducción en la mortalidad en menores de cinco años a nivel global fueron de 2.5 % en promedio al año; en contraste, de 1990 a 2001, esta reducción fue de aproximadamente 1.1% anual. Aunque podría esperarse esta desaceleración en áreas que ya habían alcanzado tasas bajas de mortalidad, este fenómeno también ha ocurrido en regiones caracterizadas por tasas altas.[1]

Se han identificado intervenciones eficaces que evitan los fallecimientos de niños en lugares con tasas altas de mortalidad y sistemas de salud poco estructurados. En los 42 países donde ocurrieron 90% de las muertes en menores de cinco años en todo el mundo en 2000, se pudieron haber prevenido 63% de ellas mediante la implementación completa de algunas intervenciones conocidas que han demostrado ser efectivas.[3]

El análisis reciente realizado por Jennifer Bryce y colaboradores[4] (cuenta regresiva a 2015) sobre el escrutinio del avance en la sobrevida de menores de cinco años confirma que en 2005, entre los 60 países en los que ocurrieron más de 94% de las muertes en menores de cinco años en el mundo, solamente siete tenían avances significativos para alcanzar el MDG4. Además, la cobertura de las 16 intervenciones clave identificadas en un estudio previo siguió siendo críticamente baja; aunque algunos países dieron enormes pasos en su cobertura, aumentando la proporción de madres y niños con acceso a intervenciones que salvarían sus vidas en hasta 10 puntos porcentuales en dos años.[4]

México es uno de esos siete países en los que se ha registrado una reducción sostenida de mortalidad en menores de cinco años y, en consecuencia, se considera que está en la dirección correcta para lograr el MDG4, es decir, reducir la tasa de mortalidad en menores de cinco años de 44.9 muertes por cada 1 000 niños nacidos vivos en 1990 a 15.0 muertes por cada 1 000 niños nacidos vivos en 2015. El presente artículo describe las intervenciones en salud pública y los avances en el reforzamiento de las instituciones que han permitido estos logros en un periodo de 25 años. Este artículo es el último de la serie de la revista británica *The Lancet* dedicado a la reforma del sistema de salud mexicano y describe el impacto en la reducción de

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la mortalidad en menores de cinco años. El objetivo al compartir esta experiencia es contribuir a incrementar las inversiones y las acciones para lograr el MDG4 en otros países.

Métodos

Fuentes de los datos. La información para este estudio se ha tomado de diferentes fuentes que incluyen datos censales, bases de los registros de mortalidad de la Secretaría de Salud y el Instituto Nacional de Estadística, Geografía e Informática (INEGI), el registro nominal de niños recolectado por el Programa de Vacunación Universal y las encuestas nacionales de nutrición. Las metodologías específicas, incluyendo su confiabilidad y sus limitaciones se han incluido en cada sección.

Causas de muerte entre los niños. La información sobre las causas de muerte se obtuvo de certificados de defunción elaborados principalmente por médicos (la elaboración de los certificados de defunción por médicos aumentó de 87% en 1980 a 98% en 2005) y se codificó de acuerdo con la 9ª y 10ª Clasificación Internacional de Enfermedades. La Secretaría de Salud y el INEGI registraron la información, la cual se somete periódicamente a controles de calidad. El censo y datos de mortalidad se refieren a la totalidad de la población mexicana y en todo el territorio del país entre 1980 y 2006. En algunos casos, las definiciones y métodos han cambiado durante el periodo de estudio (por ejemplo, para la Clasificación Internacional de Enfermedades); sin embargo, México recientemente fue clasificado entre los 20 primeros países con sistemas de registros de mortalidad de alta calidad.[5]

Tasas de mortalidad en menores de cinco años. Para corregir el registro insuficiente de muertes entre los niños en lugares rurales pobres se utilizaron métodos demográficos estándar. Se obtuvieron las tasas de mortalidad en menores de cinco años, menores de un año y neonatos en tres pasos.[6] Primero, se obtuvieron las tasas nacionales directamente de los registros de embarazos de las encuestas nacionales de fecundidad que cubren el periodo de referencia (1980-2005). Segundo, se calcularon las tasas iniciales en el ámbito estatal aplicando métodos indirectos (Brass),[7] tomando como base las tasas de mortalidad de niños nacidos vivos de los censos mexicanos de población de 1990, 2000 y 2005. Tercero, se corrigieron los valores de acuerdo con la distribución de nacimientos por estado.

Tasas de vacunación. Antes de 1990, la información sobre la cobertura de la vacunación se basaba en datos administrativos poco confiables. Desde el inicio del Programa de Vacunación Universal, todos los niños tienen un registro individual computarizado y reciben la Cartilla Nacional de Vacunación. Periódicamente se realizan encuestas seroepidemiológicas probabilísticas para monitorizar la cobertura de protección inmunológica. Los datos sobre el tamaño de la población, las condiciones de vivienda y la educación de las mujeres provienen de los Censos de Población de 1980, 1990, 2000 y 2005.

Estado nutricional. La Información sobre el estado nutricional de la población durante el periodo de estudio proviene de tres encuestas de vivienda, probabilísticas, multietápicas y estratificadas. Las encuestas son coordinadas por la Secretaría de Salud y el Instituto Nacional de Salud Pública (INSP), y son representativas de la población no institucionalizada en los años 1988, 1998-99 y 2005-2006. Las tres encuestas tuvieron cobertura nacional y fueron representativas de la población en México a nivel nacional y para cuatro regiones en 1988 y 1998-99 y para cada una de las 32 entidades federativas en 2005-2006. Las metodologías para el muestreo y las tasas de respuesta se describen en mayor detalle en otras publicaciones.[8,9] Como en prácticamente todas las encuestas domiciliarias, algunos grupos de la población (por ejemplo, población sin hogar) no pudieron ser estudiadas debido a su estilo de vida y por lo tanto no se incluyen en los resultados de la encuesta. Se usan indicadores antropométricos del estado nutricional, incluyendo bajo peso para la edad [peso para la edad < -2 desviaciones estándar de la referencia de la Organización Mundial de la Salud/Centro Nacional de Estadísticas de Salud (OMS/CNES)], bajo peso para la talla (peso para la talla <-2 desviaciones estándar de la referencia de OMS/CNES) y baja talla para la edad (talla para la edad <-2 desviaciones estándar de la referencia de la OMS/CNES).[10]

Distribución del ingreso. El INEGI, un organismo autónomo, ha realizado encuestas probabilísticas nacionales sobre Ingreso y Gastos en Hogares de manera periódica, con una metodología estandarizada, desde la década de los ochenta. Todas las encuestas son representativas a nivel nacional.

Análisis de los datos

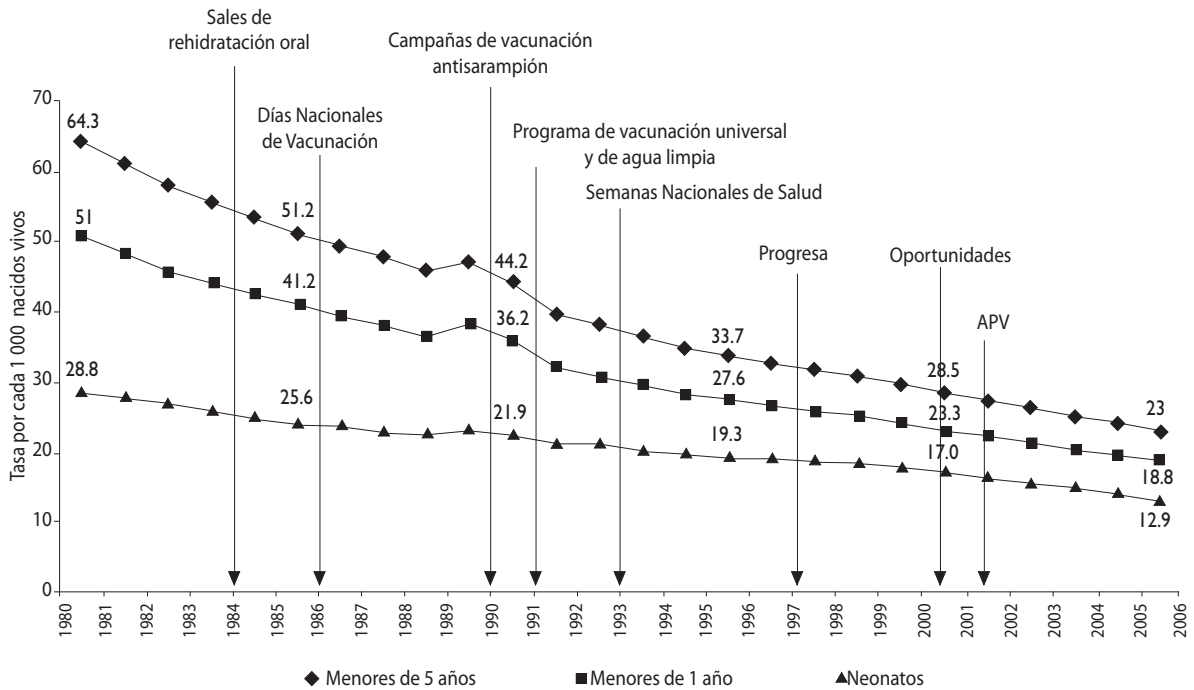
Se emplearon los modelos de regresión ordinaria de mínimos cuadrados (OLS, por sus siglas en inglés) usando el procedimiento secuencial de probabilidad máxima para identificar el mejor modelo para predecir las tasas de mortalidad en menores de cinco años. El estudio de la relación entre la mortalidad en menores de cinco años y el con-

texto socioeconómico consideró determinantes proximales y contextuales, usando los modelos OLS, tal como se describe en otras fuentes.[11] Los determinantes proximales son mecanismos básicos comunes a todas las enfermedades de interés y mediante los que deben operar todos los determinantes socioeconómicos.[12] Se seleccionaron aquellos de los que se tenía información en todas las entidades federativas de México. Se escogió baja talla para la edad y bajo peso para la edad como determinantes proximales y la educación de las mujeres (proporción de mujeres fértiles con menos de nueve años de escolaridad), cobertura de la vacuna de sarampión en niños menores de cinco años y condiciones de vivienda (proporción sin acceso a sistemas de drenaje y proporción con pisos de tierra) como variables contextuales.

Resultados

Las tasas de mortalidad en niños menores de cinco años de edad cayeron de casi 64 defunciones a menos de 23 por cada 1 000 niños nacidos vivos en los últimos 25 (figura 1). La tasa de reducción ha sido relativamente estable con pocas excepciones: un aumento repentino en la tasa de mortalidad en los años 1989-1990 es el resultado de un brote epidémico de sarampión y menor avance en la tasa de reducción en los últimos cinco años. La tasa promedio de reducción durante los 25 años fue de 1.6% anual. Como en otros países, los menores de cinco años (64.2%) tuvieron tasas de disminución ligeramente mayores que los niños menores de un año (63.1%) y que los neonatos (55.2%) (figura 1, cuadro I). El cuadro II describe la distribución de las causas de muerte en niños menores de cinco años en México. En 1980, fueron cinco causas principales las que representaron aproximadamente 60% de las muertes de niños menores de cinco años de edad: enfermedades diarreicas, infecciones de las vías respiratorias inferiores, asfixia y traumatismo en el nacimiento, bronquitis crónica y peso bajo al nacer. El sarampión se ubicó como la cuarta causa general de muerte en el país en 1990 y en varios estados pobres, como Chiapas y Oaxaca, incluso se convirtió en la primera o segunda causa de mortalidad en menores de cinco años. Durante los 25 años, la contribución de la diarrea y las infecciones de las vías respiratorias inferiores a la mortalidad en menores de cinco años se redujo de manera drástica. Las tasas de mortalidad específicas para estas enfermedades bajaron 93 y

Figura I. Mortalidad neonatal, infantil (menores de 1 año) y en niños menores de cinco años. México 1980-2005



Tasa por 1 000 nacidos vivos
Fuente: Secretaría de Salud, México/SEED y CONAPO

Cuadro I. Reducción quinquenal de las tasas de mortalidad por todas las causas en los grupos neonatal, infantil y menores de cinco años. México 1980-2005*

		% de reducción quinquenal	
		Infantil	*Niños*
Periodo quinquenal	**Neonatal**	**(menores de 1 año)**	**(menores de 5 años)**
1980-1985	11.2	19.3	20.4
1985-1990	14.3	12.1	13.7
1990-1995	12.1	23.8	23.6
1995-2000	10.9	15.3	15.4
2000-2005	24.1	19.4	19.5

* Tasa por 1 000 nacidos vivos registrados

Fuente: CONAPO

86%, respectivamente. La reducción drástica de las tasas de mortalidad por diarrea en niños menores a un año de edad en este periodo merece un análisis especial (figura 2). Después de un aumento repentino en las tasas de mortalidad por diarrea en 1983, se introdujo un programa de hidratación oral. Desde entonces, se aceleró la reducción de la mortalidad por diarrea, viéndose la disminución más importante de 1990 a 2000 (cuadro III). Estos cambios en las causas de muerte se relacionan temporalmente con la introducción de tres intervenciones significativas en salud pública: el Programa de Vacunación Universal, el Programa de Agua Limpia y las Semanas Nacionales de Salud (figura 2). Al mismo tiempo, aumentó la proporción de muertes neonatales entre todas las causas de muerte en niños menores a un año de edad de 56% en 1980 a 69% en 2005. Algunas de las otras causas de muerte en menores de cinco años, tales como las infecciones respiratorias de vías aéreas inferiores (IVAI), bajo peso al nacer (BPN), asfixia y trauma al nacimiento (AyTN) también han sufrido cambios (cuadro IV, figura 3). Las IVAI han seguido en el segundo o tercer lugar como causa de muerte en esta categoría de edad. Los índices de mortalidad en menores de cinco años debido a IVAI y BPN han disminuido en 86 y 47%, respectivamente, durante los pasados 25 años. La tasa de mortalidad debido a AyTN ha disminuido sólo en 16%, y particularmente durante los diez años pasados. Estos datos reflejan la transición de las causas de muerte en niños menores de cinco años, resultado de campañas de salud pública y de la atención primaria a la salud, que han tenido impacto principalmente sobre diarreas, infec-

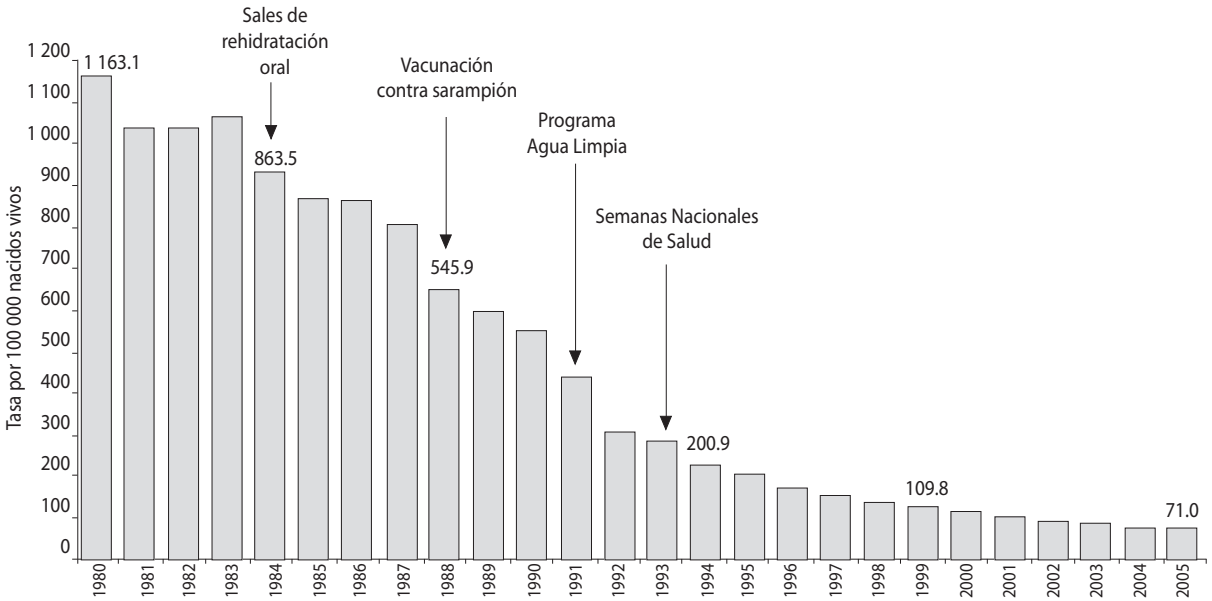
Cuadro II. Cinco principales causas de muerte en niños menores de cinco años. México 1980-2005*

	1980	Tasa	1985	Tasa	1990	Tasa	1995	Tasa	2000	Tasa	2005	Tasa
1	Diarrea infecciosa	15.2	Diarrea infecciosa	11.5	Asfixia y trauma durante el nacimiento	7.7	Asfixia y trauma durante el nacimiento	7.6	Asfixia y trauma durante el nacimiento	7.4	Asfixia y trauma durante el nacimiento	5.8
2	Infección de vías aéreas inferiores	12.5	Infección de vías aéreas inferiores	8.9	Diarrea infecciosa	7.2	Infección de vías aéreas inferiores	4.7	Infección de vías aéreas inferiores	2.5	Infección de vías aéreas inferiores	1.9
3	Asfixia y trauma durante el nacimiento	6.9	Asfixia y trauma durante el nacimiento	7.1	Infección de vías aéreas inferiores	6.3	Diarrea infecciosa	2.8	Malformaciones congénitas del corazón	1.9	Malformaciones congénitas del corazón	1.8
4	Bronquitis crónica	1.8	Bajo peso al nacer	1.1	Sarampión	2.3	Malformaciones congénitas del corazón	1.6	Diarrea infecciosa	1.6	Diarrea infecciosa	1.1
5	Bajo peso al nacer	1.5	Desnutrición proteico-calórica	1.1	Desnutrición proteico-calórica	2.0	Desnutrición proteico-calórica	1.2	Bajo peso al nacer	0.8	Bajo peso al nacer	0.8
	Tasa de mortalidad en menores de cinco años	64.3	Tasa de mortalidad en menores de cinco años	51.2	Tasa de mortalidad en menores de cinco años	44.2	Tasa de mortalidad en menores de cinco años	33.7	Tasa de mortalidad en menores de cinco años	28.5	Tasa de mortalidad en menores de cinco años	23.0

* Tasa por 1 000 nacidos vivos

Fuente: Secretaría de Salud, México

Figura II. Mortalidad por diarrea en menores de un año. México 1980-2005



* Tasa por 100 000 nacidos vivos (estimado), CONAPO y datos preliminares SEED

ciones respiratorias, bajo peso al nacer y enfermedades prevenibles por vacunación. El impacto de la mejoría en la calidad de la atención perinatal sobre asfixia y trauma al nacimiento es inferior y más reciente.

Estado nutricional de los niños durante el periodo

La desnutrición es un factor que contribuye a más de la mitad de todas las muertes infantiles en el mundo.[13] La figura 4 muestra que en México ocurrió una reducción importante en todas las formas de desnutrición de 1988 a 1999 y en 2006. El bajo peso para la talla disminuyó a menos de la tercera parte de su prevalencia original de 1988 a 2006, viéndose la reducción más importante entre 1988 y 1999. La baja talla para la edad disminuyó a la mitad aproximadamente, de alrededor de 23 a casi 13% y el bajo peso para la edad a una tercera parte, de 14 a 5%, durante el mismo periodo. La anemia y carencias de micronutrientes son sumamente frecuentes en México. En la Encuesta Nacional de Nutrición 1999, más de uno de cada cuatro niños entre uno y cuatro años (28%) era anémico. Esta prevalencia se redujo a 23.7% (-15.3%) hacia 2006. Entre un cuarto y la mitad de los niños, tenía una o varias carencias de micronutrientes. En 1999, la prevalencia de carencias de hierro, zinc y vitamina A era de 52, 33 y 27%, respectivamente.[14]

Cuadro III. Reducción quinquenal de las tasas de mortalidad por diarrea en los grupos infantil y menores de cinco años. México 1980-2005

	% de reducción quinquenal	
	Población infantil	*Niños*
Periodo quinquenal	**(menores de 1 año)***	**menores de 5 años***
1980-1985	25.8%	24.3%
1985-1990	36.8%	37.4%
1990-1995	63.2%	61.1%
1995-2000	45.3%	42.9%
2000-2005	35.3%	37.5%

Fuente: CONAPO
* Tasa por 1 000 nacidos vivos registrados

Intervenciones de salud pública durante los últimos 25 años: el enfoque diagonal mexicano

Durante los últimos 25 años se implantaron varias intervenciones de salud pública que pueden explicar la ace-

Cuadro IV. Reducción quinquenal de las tasas por infección de vías aéreas inferiores (IVAI) y asfixia y trauma durante el nacimiento (AyTN), en niños menores de cinco años. México 1980-2005*

	Porcentaje de cambio quinquenal (%)	
Periodo quinquenal	**IVAI**	**AyTN**
1980-1985	-29.2	3.1
1985-1990	-28.5	8.8
1990-1995	-25.6	-1.8
1995-2000	-47.1	-2.6
2000-2005	-27.7	-22.1

Fuente: CONAPO
* Tasa por 1 000 nacidos vivos registrados

lerada reducción de la mortalidad en menores de cinco años, en especial en menores de un año por enfermedades diarreicas (figuras 1 y 2). Estas intervenciones empezaron como programas verticales y se reforzaron en alcance conforme se fue obteniendo experiencia y éxito en los indicadores de salud. A esta estrategia se le denominó el enfoque diagonal, esto es, la provisión proactiva, impulsada por la demanda, basada en ofrecer una serie de intervenciones altamente costo-efectivas y a gran escala, que crearon un puente que unió los servicios de salud de atención primaria con los hogares (cuadro V). Esta experiencia de implementación creciente de múltiples intervenciones de salud pública podría ser el equivalente a una "polipíldora" para la salud pública.[15] En esta sección se hace una descripción de dichas intervenciones en un intento por explicar las asociaciones y los factores causales que dieron como resultado una menor mortalidad en menores de cinco años.

Terapia de rehidratación oral

La provisión de sales de rehidratación oral (SRO) es una de las intervenciones más costo-efectivas para reducir la mortalidad de niños con diarrea.[16] Se introdujo en los hospitales en México en 1984, cuando era bastante alta la tasa de mortalidad producida por diarrea. La introducción de SRO en la práctica clínica se relacionó con una reducción drástica en la mortalidad ocasionada por diarrea, de aproximadamente 60% en los siguientes cinco años (figura 2). La inclusión de SRO como parte de la serie de intervenciones en las Semanas Nacionales de Salud para el acercamiento de las clínicas a los hogares, junto con el Programa de Vacunación Universal y el Programa

Figura III. Proporción del total de la tasa de mortalidad de las cinco principales causas de muerte para 2005 en niños menores de cinco años. México 1980, 1990 y 2005

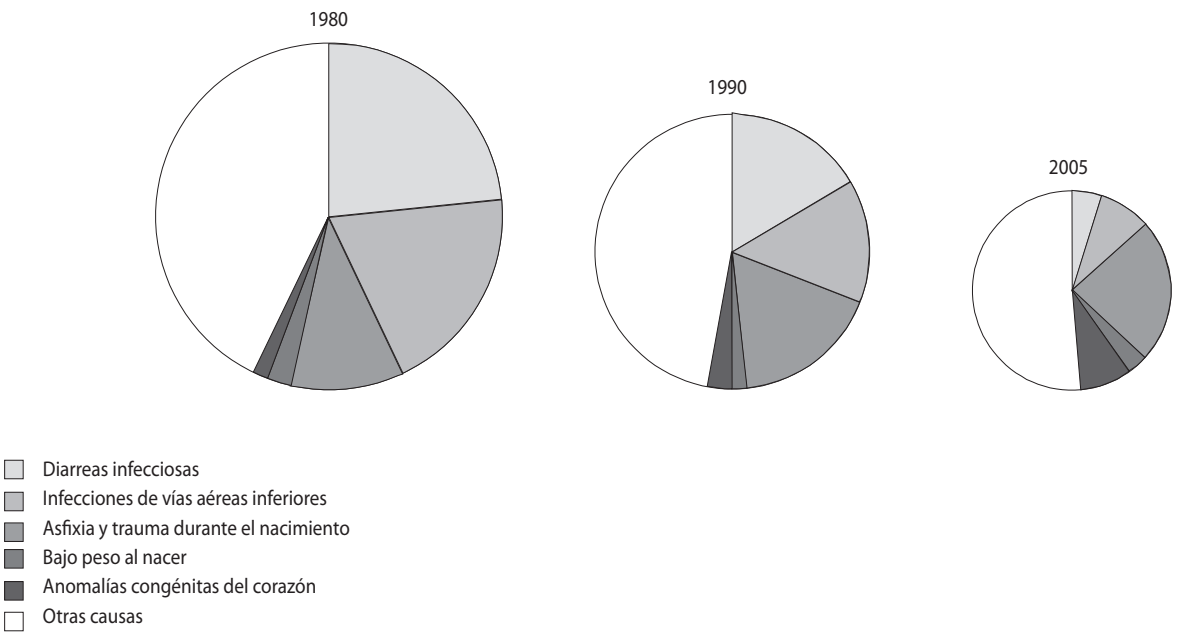
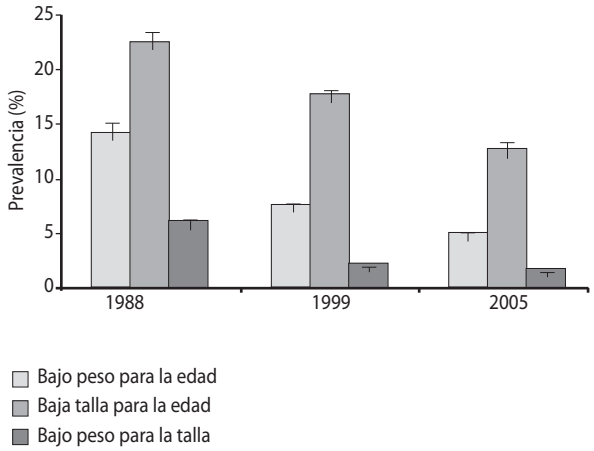


Figura IV. Tendencias de las prevalencias de bajo peso para la edad, baja talla para la edad y bajo peso para la talla. México 1988, 1999 y 2005



Indicador	1988 (IC 95%)	1999 (IC 95%)	2005 (IC 95%)
Bajo peso para la edad	14.2 (12.7-15.8)	7.6 (6.9-8.3)	5.0 (4.3-5.8)
Baja talla para la edad	22.7 (20.6-24.9)	17.8 (16.6-19.1)	12.7 (11.3-14.1)
Bajo peso para la talla	6.1 (5.4-6.9)	2.1 (1.7-2.4)	1.6 (1.2-2.1)

Fuente: Encuesta Nacional de Nutrición *Indicador <2 DSt con relación al patrón de referencia (WHO/HCHS/CDC)

Cuadro V. La estrategia diagonal

En la obra médica publicada se ha debatido largamente cuál es el acercamiento más eficaz para ofrecer intervenciones de salud: si los programas verticales o los programas horizontales. Los programas verticales se refieren a intervenciones focalizadas, proactivas y específicas para una enfermedad a escala masiva, mientras que los programas horizontales se refieren a servicios de salud más integrados, guiados por la demanda y con recursos compartidos. Esta situación es un falso dilema, porque ambas intervenciones necesitan coexistir en lo que podría llamarse un enfoque diagonal.[15]

de Agua Limpia, aceleraron aún más la reducción en la mortalidad por diarrea en la siguiente década mediante la entrega de millones de SRO a los hogares. El Programa de Agua Limpia se enfocó en la cloración adecuada del agua y en los reglamentos que prohibieron el uso de aguas residuales para el riego de hortalizas. Entre las muchas actividades que se reforzaron en previsión de un brote de cólera, la más importante fue la provisión de agua potable apropiadamente purificada, tanto por cloración de los depósitos de agua fuera del domicilio como a nivel intradomiciliario por ebullición o uso de pastillas de cloro. Otros pasos importantes fueron la disposición adecuada de las excretas, las plantas de tratamiento de aguas residuales y la supervisión y mantenimiento de los sistemas de drenaje. Además del marco jurídico que prohibió el uso de aguas residuales para la irrigación de cultivos, en las comunidades rurales se hizo especial énfasis en la construcción de letrinas, mientras que los vendedores de alimentos fueron supervisados para asegurar el cumplimiento de los reglamentos sanitarios. El agua y el saneamiento son factores de riesgo importantes para el modelo endémico de la diarrea.[17,18]

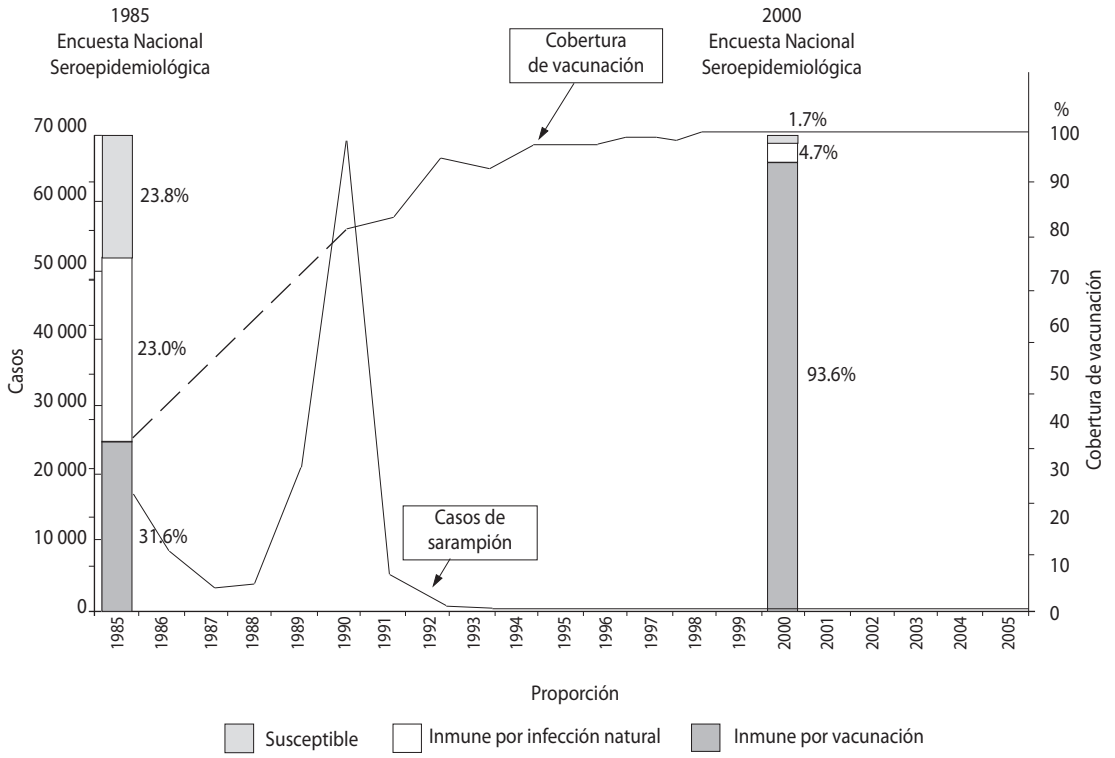
En consecuencia, el cólera en México se redujo drásticamente y también se vio una reducción sustancial en las enfermedades diarreicas por otras causas durante este periodo.[19]

Vacunación

Las vacunas han ocupado un lugar primordial entre la serie de intervenciones costo-efectivas y no individuales en salud pública. Antes de 1985, únicamente se administraban vacunas en las clínicas de salud pública a solicitud de las madres e incluían los seis inmunógenos recomendados en este tiempo por la OMS. Se desarrollaron las estrategias de vacunación vertical para pasar de un día de vacunación de poliomielitis en 1985 a semanas de vacunación en 1988, y finalmente a la introducción en 1993 de un paquete básico de servicios de salud, descritos a continuación como las Semanas Nacionales de Salud.

La figura 5 muestra el impacto de la cobertura creciente de vacunación antisarampionosa sobre los casos de sarampión. En 1989-1990 se presentó un enorme brote epidémico de sarampión en México, que causó más de 70 000 casos y 6 000 muertes, principalmente entre niños desnutridos menores de cinco años de edad habitantes de zonas rurales. El brote aceleró la creación del Programa de Vacunación Universal. Antes de 1990, la información sobre cobertura vacunal se basaba en información administrativa no confiable, los datos previos a esta fecha sobre cobertura efectiva se estimaron a partir de la Encuesta Nacional Seroepidemiológica realizada en 1985. Se realizó una encuesta probabilística nacional sobre vacunación, que serviría como la línea basal, en un cuarto de millón de hogares en 1990. Los resultados demostraron que solamente 42% de los niños de 1 a 4 años habían recibido todas sus vacunas, de acuerdo con el programa ampliado de vacunación (PAV). Dentro de los tres años siguientes, la cobertura de vacunación subió a más de 92% y se sostuvo en ese nivel en los años restantes (figura 5). Un

Figura V. Casos de sarampión y cobertura de vacunación en niños de 1 a 4 años. México 1985-2005



sistema computarizado de registros individuales para cada uno de los casi 12 millones de niños permitió tener un control de la calidad de los datos de cobertura. Además, se tomaron muestras serológicas en las encuestas probabilísticas de los hogares antes y después del Programa de Vacunación Universal. El impacto de la vacunación universal en los niños en edad preescolar fue inmediato: la última notificación de un caso de polio en México fue en 1990, de difteria en 1991 y de sarampión autóctono en 1996. En 2006, los niños y adolescentes mexicanos recibieron uno de los programas de vacunación más completos en el mundo, que incluyó hepatitis B, DPaT (difteria, tosferina acelular y tétanos), Hib (vacuna contra H influenzae tipo b, VPI (vacuna contra el poliovirus de tipo inactivada), SRP (sarampión, parotiditis y rubéola), Antineumocócica conjugada (VNC), Influenza, Rotavirus y BCG (bacilo de Calmette-Guérin). El costo individual de las vacunas fue de aproximadamente 200 dólares.

Semanas Nacionales de Salud

Con la experiencia que se obtuvo de los Días de vacunación de poliomielitis, en 1993, se expandió la estrategia a una semana completa, dos veces al año, dedicada a la salud de los niños en sus hogares, escuelas o clínicas. Además de todas las vacunas del programa ampliado de vacunación de la OMS, también se incluyó un paquete de intervenciones sumamente costo-efectivas: megadosis de vitamina A oral, terapia antihelmíntica masiva (albendazol) y la promoción activa de sales de rehidratación (SRO). Esta estrategia comprobó ser efectiva y eficiente y con una gran aceptación social.

Se incluyó la administración de megadosis de vitamina A (100 000 IU a niños entre 6 y 12 meses de edad y 200 000 IU a niños entre 12 y 36 meses) como un componente de las Semanas nacionales de salud en áreas con tasas altas de deficiencia de este micronutriente. Un estudio que evaluó a los niños que vivían en barrios pobres en un estado del norte de México reveló que la distribución masiva de vitamina A pudo haber tenido un impacto importante en los niveles séricos de retinol en los niños. Los valores basales mostraron que 6.3% de los niños tenía una deficiencia severa de vitamina A, que desapareció en los periodos posteriores a la suplementación.[20] También se evaluó el tratamiento de terapia antihelmíntica masiva a niños entre 2 y 14 años, residentes en municipios de alto riesgo. Los resultados demostraron que se obtuvo una tasa de curación satisfactoria, definida como la proporción de

niños que no tuvieron un solo huevecillo de geohelminto después del tratamiento, de entre aquellos que habían tenido por lo menos un huevecillo antes de tratamiento. Además de los beneficios en salud, esta intervención probablemente contribuyó a mejorar el estado nutricional de los niños.[21]

Oportunidades (antes Progresa)

En 1997, el gobierno federal implantó un programa condicional de transferencia de efectivo (*Oportunidades*) enfocado en aproximadamente 300 000 hogares de bajos ingresos en áreas rurales. Para 2005, *Oportunidades* cubría a cerca de cinco millones de hogares de bajos ingresos (aproximadamente 25% del total de los hogares), tanto en áreas rurales como urbanas. Se proporcionan las transferencias de efectivo a las mujeres como incentivos financieros para conductas preventivas de salud y nutrición y como un incentivo para que los niños no abandonen la escuela. Las familias no reciben los beneficios del efectivo a menos que asistan con regularidad a clínicas de salud, donde reciben servicios de salud y nutrición. El programa también distribuye suplementos de alimentos a todos los niños de 6 a 23 meses de edad y a niños de bajo peso de 2 a 4 años en las viviendas seleccionadas. El suplemento es una mezcla seca de leche entera, azúcar, maltodextrinas, vitaminas y minerales en diferentes sabores, que después de la adición del agua produce un suplemento con la consistencia de un puré. Las familias de niños elegibles son dotadas de cantidades de suplemento que proveen una dosis diaria con los nutrimentos siguientes (porcentaje según las recomendaciones dietéticas de Estados Unidos para niños 1 a 3 años): 15% de energía, 36% de proteína y 100% de hierro, zinc, ácido fólico y vitaminas A, E, C y B12. El costo medio de cada ración diaria está en alrededor de 0.09 dólares. El programa estuvo sujeto a una evaluación independiente rigurosa y ha mostrado tener efectos positivos en el estado nutricional de los niños. Se realizó un estudio aleatorizado de efectividad en 347 comunidades asignadas de manera aleatoria a la incorporación inmediata al programa en 1988 (grupo de intervención; n= 205) o a su incorporación en 1999 (grupo de intervención cruzada; n= 142). Para los dos grupos de estudio se seleccionó de manera aleatoria a un total de 650 niños de 12 meses de edad o menores (n= 373 en el grupo de intervención; n= 277 en el grupo de intervención cruzada) y se estudiaron antes de la intervención y 1 y 2 años después. El programa se relacionó con un mayor crecimiento en estatura (1.1 cm; p<0´05) entre los menores de un año provenientes de los hogares más pobres (la mitad de los hogares de bajos ingresos) y los más pequeños (< 6 meses en el momento de su inclusión) después de dos años. Asimismo, después de un año de su inclusión en el programa, la tasa de anemia ajustada por edad (nivel de hemoglobina <110 g/dl) fue 19% más alta en el grupo de intervención cruzada que en el grupo de intervención (54´9% vs. 44´3%; p=0.03).[22]

Arranque Parejo en la Vida

En 2001 la Secretaría de Salud de México lanzó el Programa Nacional Arranque Parejo en la Vida (APV).[23] El objetivo principal era reducir las tasas de mortalidad maternas y perinatales, mejorando el servicio médico materno-infantil tradicional. Algunos de estos elementos innovadores son: promoción de la participación social y de la comunidad, fortalecimiento de la estructura y del modelo de atención médica materna y perinatal mediante la reorganización del nivel primario y de urgencias en las áreas más afectadas y marginadas, intervenciones clave de prevención como tamizaje neonatal y complementación de ácido fólico para las mujeres, capacitación de las parteras tradicionales y de personal alternativo calificado y servicios articulados en la comunidad e institucionales. El APV es una estrategia que incluye los esfuerzos y recursos conjuntos de las comunidades locales, la sociedad civil y los diferentes niveles de gobierno. Desde que inició el programa APV, la atención en los partos proporcionada por personal calificado aumentó de 69% en 2000 a 91% en 2005.[24] La cobertura de cuidados prenatales incrementó de 82% en 2000 a 88% en 2005 en el ámbito nacional, con un importante crecimiento en Chiapas (36%, de 64 a 87%), Oaxaca (35%, de 66 a 90%) y Veracruz (22%, de 69 a 85%). En la actualidad, se ha apoyado a un total de 265 clínicas y hospitales con equipo médico; el APV abrió 50 Posadas AME, donde se pueden quedar las mujeres de comunidades lejanas que necesitan atención médica, antes y después del parto, y en varias comunidades ha mejorado el transporte para acudir a los hospitales locales mediante radiocomunicación, apoyado por personas involucradas de la localidad y coordinado con instituciones gubernamentales. Se está llevando a cabo un estudio para evaluar el impacto que ha tenido el APV a nivel de la población.

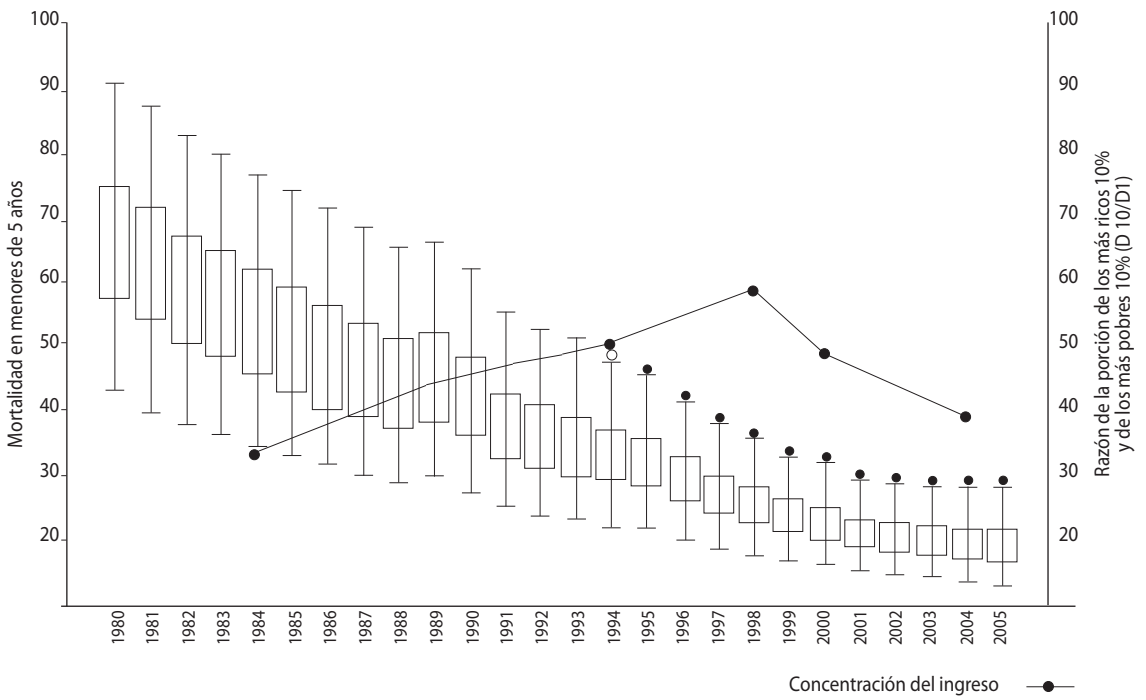
Desigualdades en la distribución de los ingresos y la salud

México se caracteriza por grandes desigualdades en la distribución de la riqueza. El índice Gini,[25] una medición

de la desigualdad social, clasificó a México entre 0.5 y 0.6 durante el periodo de estudio. El valor Gini más bajo (0.51) corresponde a los primeros años del periodo para los que hay información Gini disponible (1984), cuando el decil de ingreso más alto acumuló aproximadamente 40% de la riqueza, mientras que el más bajo acumuló solamente 1%. El valor Gini más alto (menos equitativo) corresponde a 1992 (0.6), cuando cerca de 53% de la riqueza estaba en manos del 10% más rico, mientras que el 10% más pobre tenía menos de 1% de la riqueza. Después de 1992 no ha cambiado el índice Gini de manera sustancial, con valores en el rango de 0.53 y 0.56. Otros expertos prefieren describir la concentración de los ingresos en México usando la relación de participación de 10% de los más ricos sobre 10% de los más pobres. (D10/D1).[25] Es frecuente creer que la desigualdad en los ingresos produce inevitablemente desigualdad en la salud.[26] En México, hay evidencia que indica que a pesar de las grandes desigualdades en ingresos, se puede mejorar la salud en gran medida, incluso en los estratos más pobres de la población.

La figura 6 muestra la reducción secular, tanto en los niveles generales de mortalidad en menores de cinco años como en la varianza entre las 32 entidades federativas de México. Esta reducción ocurrió a pesar de que la concentración de los ingresos, definida aquí como la relación del decil más rico sobre el decil más pobre, aumentó durante este tiempo. De manera similar, aunque se llevó a cabo la reforma económica estructural, las disparidades en las expectativas de vida en las regiones de México se han reducido de manera lenta, pero constante.[27] Un ejemplo claro es el progreso alcanzado en las enfermedades prevenibles por vacunación. Los niveles de cobertura que se obtuvieron en las áreas rurales indígenas fueron similares a los de las regiones industrializadas urbanas; los niños de familias pobres estaban igualmente protegidos que aquellos que pertenecían a estratos más privilegiados, dando como resultado lo que se conoce como "equidad inmunológica" (comunicación personal con el Dr. Jesús Kumate). Se presenta la evidencia en la figura 5, que muestra la relación entre la protección inmunológica y el sarampión, obtenida de encuestas seroepidemiológicas, y las tasas de

Figura VI. ***Box-plot*** de los niveles, varianza y tendencias de la mortalidad en menores de cinco años y la concentración del ingreso. 1980-2005



Fuente: Análisis por los autores a partir de los datos de la ENIGH (Encuesta Nacional de Ingresos y Gastos en Hogares) 1984-2004

cobertura de vacunación. La igualdad inmunológica produjo la eliminación del sarampión autóctono y el control de otras enfermedades prevenibles con vacunas en todos los grupos socioeconómicos de la población.

Contribución de los diferentes factores determinantes para la reducción de la mortalidad en menores de cinco años

En un intento por entender mejor la contribución de varios factores determinantes en la salud en menores de cinco años y en la reducción observada de la mortalidad en este grupo de edad en México, se realizó un análisis de la variación en las diferentes entidades federativas, y medimos el poder de la asociación entre esos factores determinantes y la reducción de la mortalidad en los niños menores de cinco años. Como no se contaba con datos de ingresos de todos los estados, no incluimos las mediciones de ingresos en el análisis de regresión. Se relacionaron todos los determinantes contextuales y proximales con la reducción en las tasas de mortalidad en niños menores de cinco años (coeficientes de correlación ≥ 0.66) (cuadro VI). El mejor modelo de regresión de OLS para predecir las tasas de mortalidad en estos niños (cuadro VII) incluyó como variables independientes la prevalencia de bajo peso para la edad, el porcentaje de mujeres con baja escolaridad y la cobertura de la vacunación de sarampión, todas estadísticamente significativas (p<0.05). El modelo explicó casi 95% de la varianza por estados de la mortalidad en menores de cinco años (R2= 0.95). La magnitud de los coeficientes de regresión indica que por cada 10% de aumento en la cobertura de sarampión, se logra una reducción de 5.1 muertes por cada 1 000 nacidos vivos; de manera similar, por cada reducción de 10% en el bajo peso para la edad y en la baja escolaridad de las mujeres, hay una disminución de 3.7 y 3.6 muertes por cada 1 000, respectivamente. La asociación entre reducción en las tasas de mortalidad y escolaridad de las mujeres se confirmó por el incremento dramático en la educación formal de las mujeres durante el periodo de estudio. El porcentaje de mujeres con edad de 15 a 49 años sin escolaridad ha disminuido de 13.7% en 1980, a 10.6% (1990), 6.5% (2000) y 4.7% (2005), mientras que el porcentaje de mujeres en el mismo grupo de edad con secundaria completa o mayor nivel de educación ha aumentado de 5.8% en 1980, a 11.6% (1990), 23.3% (2000) y hasta 29.1% (2005).

Cuadro VI. Coeficientes de correlación lineal entre las tasas de mortalidad en niños menores de cinco años y determinantes proximales y de contexto en México. (1988 y 1999 nivel regional y 2005 nivel estatal)

Variables	Coeficientes
Determinantes proximales	
Prevalencia de bajo peso para la edad (niños <5 años)	0.71
Prevalencia de baja talla para la edad (niños <5 años)	0.87
Determinantes de contexto	
% de mujeres de 15 a 49 años de edad con escolaridad menor a 9 años	0.94
% de la población sin acceso a sistemas de disposición de excreta	0.79
% de la población que habita en viviendas con piso de tierra	0.66
% de los niños de 0 a 4 años de edad con antecedente de vacunación antisarampionosa	-0.81

Fuente: Estimación de CONAPO de las tasas de mortalidad en niños menores de cinco años, Encuestas Nacionales de Nutrición 1988, 1999 y 2006; Censos Generales de Población y Vivienda 1990, 2000 y 2005; CONAVA

Cuadro VII. Coeficientes de regresión ordinaria de mínimos cuadrados de algunas variables determinantes de la tasa de mortalidad en niños menores de cinco años en México. (1988 y 1999 nivel regional y 2005 nivel estatal)

Variables determinantes	Coeficientes
Porcentaje de niños menores de cinco años con bajo peso para la edad	0.37*
Porcentaje de mujeres de 15 a 49 años con menos de 9 años de escolaridad	0.36‡
Porcentaje de niños de 0 a 4 años con antecedente de vacunación contra el sarampión	-0.51‡
Constante	54.05‡
Coeficiente de determinación (R^2)	0.95

* p=0.05
‡ p=0.01

Fuente: Estimación de CONAPO de las tasas de mortalidad en niños menores de cinco años, Encuestas Nacionales de Nutrición 1988, 1999 y 2006; Censos Generales de Población y Vivienda 1990, 2000 y 2005; CONAVA

Discusión

En este estudio se mostró que durante los pasados 25 años, las tasas de mortalidad en México decrecieron de 64 a 23 por cada mil nacidos vivos. Se registró un descenso drástico en las tasas de mortalidad por diarrea, y se eliminaron la polio, la difteria y el sarampión. El estado nutricional de los niños mejoró de manera significativa en cuanto a bajo peso para la talla, baja talla para la edad y bajo peso para la edad.

Aunque no podemos medir con exactitud la contribución relativa de cada una de las intervenciones descritas en el artículo, parece haber una conclusión clara: las intervenciones en salud pública, cuando se aplican con la cobertura sostenida necesaria y hacia poblaciones vulnerables, tienen un impacto en la mortalidad infantil, incluso frente a una situación económica adversa. Por lo tanto, para los países que tratan de alcanzar el MDG4, es importante no solamente invertir en medidas que mejoren su crecimiento económico, que claramente tendrá un impacto en sus tasas de mortalidad en menores de cinco años a la larga, sino también en mejorar de manera urgente la cobertura de las intervenciones clave para la supervivencia de los niños.

Este artículo tiene varias limitaciones. No es posible demostrar una asociación causal entre una intervención y la reducción de la mortalidad en menores de cinco años sin un grupo control y un diseño prospectivo que controlen varios de los factores determinantes (variables confusoras). Además de ser retrospectivo, el estudio utiliza series de datos que fueron recolectadas para diferentes propósitos, y en algunos casos (por ejemplo, la Clasificación Internacional de Enfermedades), las definiciones y metodología han cambiado en los últimos 25 años del periodo de estudio. Sin embargo, la asociación temporal, la cobertura nacional del censo y las estadísticas de mortalidad, y la representatividad nacional de las encuestas nutricionales, junto con la plausibilidad biológica y la experiencia global acumulada en salud, permiten inferir una vía causal.

Nuestro análisis también muestra que el camino para reducir la mortalidad infantil cuenta con múltiples facetas e incluye varios sectores. La brecha entre el sector salud y las políticas e inversiones intersectoriales es otra falsa dicotomía que la experiencia mexicana ha reducido. En muchos países, se ha descubierto que la educación de las madres aumenta la supervivencia de los niños y reduce su desnutrición, incluso cuando se mantienen constantes otros factores determinantes. El vínculo entre la educación materna y la salud infantil, y la tendencia a que las mujeres pobres tengan una menor escolaridad, es una de las explicaciones clave de por qué los niños más pobres mueren en edad temprana y no están bien nutridos.[28] En México, la educación de las mujeres, como lo han demostrado muchos otros estudios, ha sido un factor clave para el progreso en la reducción de la mortalidad infantil. Evaluamos esta hipótesis mediante el análisis de regresión de determinantes, el cual demostró que el nivel educativo de la madre se correlaciona con las tasas de mortalidad en menores de cinco años, a pesar del hecho de que el análisis de datos no-jerárquicos subestima el papel de determinantes distales cuando el modelo de regresión también incluye variables proximales, tales como cobertura de vacuna del sarampión, y el estado antropométrico de los niños. Aún más, la experiencia que se ha obtenido con las transferencias de dinero en efectivo condicionadas demuestra el vínculo con la protección social, y probablemente explica parte de la reducción en las desigualdades de salud, a pesar de la persistencia de las desigualdades en los ingresos.

Típicamente, se ha reconocido que las fuentes de agua potable, en términos de calidad, pero especialmente de cantidad, y el saneamiento adecuado producen mejores resultados en la salud en menores de cinco años.[29-31] El suministro de agua potable en México es por ley la responsabilidad de las autoridades municipales. Desgraciadamente, antes del resurgimiento del cólera, esta actividad no era una prioridad para muchos funcionarios municipales. Paradójicamente, la última pandemia de cólera, que llegó a México en junio de 1991, produjo un beneficio paradójico. Esto obligó a la implementación de un ambicioso programa de saneamiento para prevenir brotes de enfermedades causados por contaminación de agua y de alimentos básicos.[19]

En un comunicado previo, se documentaron las consecuencias benéficas del nuevo ingreso del cólera.[19] Es necesario hacer mención especial de la importancia de la coordinación intersectorial. El abasto de agua potable fue responsabilidad de la Comisión Nacional del Agua, de las Comisiones estatales del Agua, y de las autoridades municipales. La Comisión Nacional del Agua fue el organismo federal autorizado para administrar el agua, proteger los suministros de agua y reforzar la legislación con respecto a las descargas de agua y su tratamiento. Estas actividades se vincularon con varias secretarías como la de Agricultura y Medio Ambiente y Recursos Naturales. Estos niveles se coordinaron con otros sectores públicos y privados para promover la purificación apropiada del agua, tanto fuera de casa mediante la cloración de las fuentes abastecedoras, como dentro de los hogares mediante la práctica de hervirla y clorarla.

Aunque las causas para las reducciones en la mortalidad en menores de cinco años y en la desnutrición tienen mucho en común, es muy probable que la reducción en la desnutrición aguda y crónica en México haya impactado sobre la reducción de las tasas de mortalidad en menores de cinco años durante el periodo de estudio. La relación entre infección y desnutrición es sinérgica. Las infecciones afectan adversamente el estado nutricional por el menor consumo de alimentos, la disminución de la absorción intestinal, el mayor gasto de energía por la fiebre, catabolismo y secuestro de nutrientes requeridos para el crecimiento tisular. Por otro lado, la desnutrición puede ser un factor que favorezca las infecciones por su impacto negativo en la protección de tipo barrera que proporcionan la piel y las membranas mucosas y por inducir alteraciones en la función inmunológica del huésped.[32-34] Aún más, incluso la desnutrición leve y moderada, que se redujo de manera sustancial en México durante el periodo de estudio, aumentan el riesgo de muerte.[35]

Por lo tanto, las intervenciones para reducir la incidencia de infecciones, como las vacunas y el agua y saneamiento, o para reducir su duración y severidad, como SRO, han tenido un impacto positivo directo en la sobrevida y han contribuido a lograr un mejor estado nutricional. Al mismo tiempo, las intervenciones para mejorar el estado nutricional, que incluyen a los micronutrientes, han tenido impacto en la reducción de la mortalidad, puesto que la anemia y las deficiencias de micronutrientes tienen una alta prevalencia en México.

En todo el mundo, se calcula que la anemia por deficiencia de hierro es un factor subyacente en 841 000 muertes al año, resultado de causas maternas y perinatales, y esto causa directamente las muertes de 134 000 niños pequeños al año. Al mejorar los niveles de hierro no solamente se reduce la anemia sino que también se pueden prevenir muchas muertes.[13] Además de contribuir a la baja talla para la edad, se calcula que la deficiencia de zinc es responsable de aproximadamente 800 000 muertes cada año por diarrea, neumonía y paludismo en niños menores a cinco años en el mundo. Cuando se mejoran los niveles de zinc se previenen y se palian la diarrea y la neumonía.[13] Aunque los tratamientos antihelmínticos no tienen un impacto directo en la mortalidad, contribuyen a reducir otros factores de riesgo como el retraso en el crecimiento y la anemia.

Como se describió en otros artículos de esta serie,[36,37] en la experiencia de salud pública del país se ha reducido la división artificial entre el enfoque "vertical", que atiende prioridades específicas de enfermedades, y el enfoque "horizontal", centrado en fortalecer la estructura y funciones globales del sistema de salud. Para poder ir más allá de este falso dilema, y ampliando la metáfora geométrica para buscar lo que aquí se ha llamado la aproximación "diagonal", las autoridades de salud de México definieron una estrategia en la que se usaron prioridades explícitas de intervenciones para fomentar las mejoras requeridas en el sistema de salud. En un intento por reducir la mortalidad en menores de cinco años, las autoridades de salud se enfocaron inicialmente en una serie de intervenciones costo-efectivas, como vacunación, complementación de vitamina A, SRO o desparasitación, que alcanzaron y mantuvieron cobertura alta en la población. Existe evidencia significativa del impacto que han tenido estas intervenciones en la mortalidad en menores de cinco años en otros países.[16,38] En la reciente reforma mexicana, tal y como se describió en González-Pier y colaboradores, la continua instrumentación y expansión de estas intervenciones ha constituido un aspecto esencial. Su impacto documentado ha permitido la creación de un fondo separado para la comunidad y para las intervenciones sanitarias dirigidas a la población total, independientemente de la cobertura en seguridad social a nivel individual.[39] Mientras emergía la evidencia sobre la costo-efectividad para otras intervenciones, y tomaba lugar la transición epidemiológica en las causas de muerte infantil, México creó un conjunto de intervenciones dirigidas a la salud materna, infantil y neonatal. Análisis recientes confirman que la cobertura efectiva para este conjunto es más alta que para las intervenciones que cubren otros problemas de salud de los adultos.[24]

En resumen, la función importante que ha desempeñado el liderazgo en salud, el desarrollo de capacidades en los sistemas institucionales, tanto en el sector público como privado, el fortalecimiento de recursos humanos y la continuidad de las políticas durante más de dos décadas, fueron los ingredientes para la estrategia exitosa en la reducción de la mortalidad en menores de cinco años. (cuadro VIII). Esta experiencia podría ser útil en otros países con tasas altas de mortalidad infantil.

El reto que todavía debe enfrentar México es la reducción de la mortalidad neonatal. En 2005, varios investigadores y organizaciones enfocaron la atención mundial en el neonato, en el progreso relativamente lento para reducir el número de muertes en el periodo temprano de la vida,[1,43-45] y mostraron que hay intervenciones efectivas disponibles.[43] El Informe Mundial de Salud de 2005 hizo hincapié en la necesidad de la integración de la salud materna, neonatal e infantil y ha surgido el concepto de un "continuum de cuidado" para enfrentar la mortalidad

Cuadro VIII. Liderazgo, desarrollo institucional y fortalecimiento de los recursos humanos

México ha tenido el privilegio de contar con un fuerte liderazgo y continuidad en sus políticas de salud en los últimos 25 años. Todos los Secretarios de Salud durante los gobiernos de 1982 a la fecha han tenido sólidos antecedentes académicos y experiencia administrativa, complementados por un conocimiento claro de las necesidades de salud pública. Todos concluyeron sus sexenios (con una excepción) y continuaron con las políticas de salud basadas en la población de los gobiernos anteriores, conservando un enfoque orientado a proteger la salud y bienestar de los niños y de la población vulnerable.[40] Esta cultura académica orientada a resultados se filtró desde los niveles superiores. Se reclutó a científicos de alto nivel y administradores modernos, al igual que a jóvenes recién graduados de escuelas de salud pública de Estados Unidos, entre el personal de la Secretaría de Salud, para crear equipos sólidos que concibieran los programas e implantaran los resultados descritos en las secciones anteriores. Las generaciones más recientes provinieron de programas como el de Capacitación de Epidemiología Aplicada (FETP por sus siglas en inglés), que se inició en 1982, en asociación con los Centros para el Control y Prevención de Enfermedades (CDC) y el Instituto Nacional de Salud Pública (INSP). Esta institución de investigación y enseñanza de postgrado fue creada en 1987 con la misión de transformar las ideas en políticas sanitarias, así como modernizar la formación de recursos humanos. El INSP ha estado involucrado en varias de las evaluaciones descritas, y ha contribuido al desarrollo de evidencias para las políticas en la salud en menores de cinco años durante los últimos 20 años. El reforzamiento de los recursos humanos ha sido fundamental en el desarrollo de un sólido sistema de la salud pública en México. La gran mayoría del personal experimentado al cargo de la Secretaría de Salud tiene estudios de posgrado, y son ahora miembros al servicio de la comunidad. Como se describió en Gakidou y colaboradores,[41] de 2001 al 2005, el número de médicos y enfermeras por cada 1 000 habitantes, ha incrementado de 0.83 a 0.94. Asimismo, la razón alto/bajo estrato socioeconómico ha disminuido de 4.27 a 4.03. Por lo tanto, las habilidades y capacidades desarrolladas en los últimos 25 años han sido esenciales en la elaboración de políticas apropiadas y programas para la salud infantil en México, y probablemente han contribuido a la reducción de la mortalidad en menores de cinco años, como lo sugiere un reciente análisis comparativo entre países.[42]

materno-infantil como un nuevo paradigma. Hay dos dimensiones en este continuo: tiempo ±desde antes del embarazo, durante el embarazo, el parto y los primeros días y años cruciales de vida±; y lugar ±entre los hogares y el sistema de salud, incluyendo vínculos entre los diferentes niveles del recinto de salud±.[46,47] La estrategia diagonal mexicano y el programa APV ya contienen en su diseño algunos de los ingredientes necesarios para la reducción con éxito de la mortalidad infantil global. Será crucial continuar con las inversiones y los compromisos en los próximos años en esta área y evaluar de manera rigurosa el avance y la cobertura efectiva.

Colaboradores

Jaime Sepúlveda coordinó el grupo y cada paso del proceso. Jaime Sepúlveda, Flavia Bustreo, Roberto Tapia, Juan Rivera, Rafael Lozano, Gustavo Olaiz, Virgilio Partida, Lourdes García-García y José Luis Valdespino participaron en el marco conceptual, en la recolección y análisis de los datos y redactaron y revisaron el informe.

Reconocimientos

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Equity, governance and financing after health care reform: lessons from Mexico*

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Greater equity, improved governance and greater financial protection in health are the main axes directing the reform projects in most countries, particularly in Latin America. Through several strategies and new prioritary programmes, the health reform in Mexico has been implementing important changes in financing, as well as in the production of health services, involving all actors in the health system.

With the proposal to integrate a new social protection for health system, the Mexican health reform offers public insurance to all citizens as it faces challenges in equity, governance and financing. These challenges have historically gone unattended and continue to be a part of the substantial problems existing in the health systems. This reform seeks to articulate the different social actors to make health democratization concrete, as well as the negotiation of resources, together with other sectors competing for social expenditure. This negotiation must be based on a better understanding of which financial resources are required by the sector at three decision-making levels (national, state and municipal), what are its priorities and, above all, what are its present mechanisms for the obtainment and allocation of financial resources.

Changes in health policies, which come together with Mexico's new economic policy, have led to health sector adjustments that are included in the Health Sector's Reform (SSA, 2002). The reform project searches for health care alternatives for the whole population that are adjusted to payment abilities and health needs. There is a special interest in ensuring that those who require the service should not be marginalized from the system and should receive at least basic coverage for the promotion and conservation of health under the principles of financial protection, equitable access and good quality of care (Mesa-Lago, 2005).

New strategies in financing policies for health services are one of the main elements in the Mexican health care reform (Arredondo et al., 2005). Equity, governance and financing policies were set forth, directed towards exploring financing mechanisms and social actors to generate new financing alternatives with local resources for the production of health serices (SSA, 2005; Frenk, 1996). A proposal was made to generate new social participation mechanisms, as well as political and financial management strategies that would allow for a greater independence of the state and municipal levels, in production as well as the financing sevices (Armada et al., 2001; WHO, 2000).

In this context, during the 2003-2006 period, a qualitative study was developed in Mexico to determine, from the perspective of all involved actors, the main effects of reform strategies on three of the substantial problems of

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health systems: equity, governance and financing. Particularly, the main results of this study are presented in this article. Evidence of the strengths and weaknesses generate from the health reform in Mexico is presented in detail. On the other hand, in a more general way, the article highlights the main evidence as lessons learned which may be taken as reference in other middle-income countries where similar health reforms are being implemented.

Conceptual considerations

The theoritical approach for this analysis used three levels of conceptual approach: equity, governance and financing:

Equity

For some authors (Williams and Cook, 2000), equity in health has to be distinguished from equity in access to health care, or equity in the distribution of health care resources. Although they mostly follow the economists' custom of regarding equity as synonymous with reducing inequalities in health, their proposal also considers the much richer variety of concepts employed by philosophers when discussing distributive justice. What they have sought to do is to identify the implications of various philosophical theories of justice for the way in which a welfare economist might appraise a particular distribution of health within a community. To do this it is necessary to distinguish theories which place constraints on admissible outcomes (the health opportunity set), from theories which require the social welfare function (or maximand) to have particular properties. In our study, we go back to some of these considerations. We studied health equity in the allocation of resources as a function of health needs and the population's purchasing power. It is the absence of health inequalities among the social groups (Arredondo, 2006). A health inequality is an inequity, since it is strongly associated with unfair social structures that gradually leave the disadvantaged groups at greater risk of having bad health. For its analysis, qualitative indicators are used based on the analysis of changes in financial allocation mechanisms and criteria (Gallardo and Beeharry, 2002; Vargas et al., 2002).

Governance

The concept of health governance refers to the way in which political actors within health system (providers) and the civil society (users, community leaders and NGOs), by means of explicit processes and rules, interact to produce, distribute and consume health as a good in relation to health services demand and population health needs (Arredondo, 2006). All health systems reflect a particular set of social and political agreements between the above-mentioned actors, particularly between the State and society. Designing and carrying out strategies for health policies in a successful manner will require a broad consensus between all political actors (Dolowitz and Marsh, 1996; Quentin, 2002; Cogan, 2005).

Financing

This analytical variable represents, in a descriptive manner, the origin, amount and flow of financial resources used in the production of health services (Abel-Smith and Dua, 1988; Green et al., 2000; Bossert, 2003). For its analysis, the following indicators are used: financing sources, financing funds, financing amounts by type of provider, allocation mechanisms and final destination of resources.

Methodology

The methodological approach stemmed from a cross-sectional study oriented towards the analysis of financing, governance and equity indicators for the uninsured population. The universe of study included six Mexican states that were selected according to the following criteria: (1) different socio-economic development, according to the marginalization index; (2) implemented strategies of health care reform, with changes in health service financing policies, resource allocation and social participation; (3) the existence of a database with economic information; (4) technical capacity in health financing policies and decentralization, as well as in the management of some financing indicators to support data collection and collaborate with the research team in an interdisciplinary manner and (5) technical and political commitment to using the study's results. For the purpose of the study, the involvement of state teams was mostly high, though participation was limited by governmental and administrative changes.

Selected states are located in the south, central and northern regions of Mexico and their names were omitted to preserve the anonymity of the sources. For the purpose of analysis, a regionalization was done based on the description of six states, taking into account the following criteria: per capita income, marginalization index (de-

veloped at the municipal level by the Population Board, using indicators such as drinking water, electrification, type of household, crowded living conditions, illiteracy, belonging to the formal economy, mean annual income (18)), financial co-responsibility index (determined by the state contribution vs. the federal contribution) and epidemiological profile (epidemiological lag based on mortality rates at the state level).

Some of the characteristics of the selected states are described in Table 1. Region A states report greater marginalization, lower public insurance indexes, as well as greater epidemiological lag. This contrasts with regions B and C, which showed lower marginalization indexes, higher levels of public insurance and a smaller epidemiological lag. A noticeable difference between regions is their concentration of indigenous population, which is higher in region A, whose states concentrate close to 50% of this population at the national level.

Two hundred and forty in-depth interviews were applied in all selected states, with the support of three researchers with experience in data collection: 60 decision-makers, including medical and administrative personnel; 60 service providers at health centres; 60 representatives of civil organizations, including municipal representatives and, finally, 60 members of health committees and users of services at first level of care units. The information was obtained through in-depth semi-structured interviews, using a thematic guide with questions and requesting authorization to carry out the interview and record it.

Interviewing instruments/tools were designed for four types of informants: decision-makers, providers, users and community/NGO leaders. These instruments had open questions for each of the project's conceptual dimensions. With respect to financing, decision-makers and providers were asked about financing sources and funds linked to reform policies; with users and community leaders, their support for the fundraising efforts of the state health system was explored. In matters of equity, informants who were linked to the health system were asked about the application of distribution criteria for resource allocation; with users and community leaders, this theme explored out-of-pocket expenditures and financial protection experiences. Finally, health governance was explored with all groups of informants, asking about processes, roles and participation mechanisms for healthcare, as well as local accountability practices.

To control for possible biases in the information and its interpretation, various methodological processes were determined. A pilot study of the interview guide was carried out and a training and standardization programme was developed for the instruments. All interviews were performed by the same two researchers in the six states (who are experts in health policies and highly trained in in-depth interviewing). The analysis of results was controlled through an analysis plan and the design of graphs of the results; these were processed using ATLAS-ti software and monitored with POLICY MAKER software. To control biases in the analysis of findings, the interpretation of results was done by experts in the interpretation of qualitative results in health systems. The interviews were transcribed and analyzed using the ATLAS-TI software. During this procedure, the information was analyzed by thematic segmentation using 12 codes defined by the research objectives and topics for the interview guides.

Once the interviews were codified, tables of contents were put together and a measurement scale was developed, based on the total number of references to a topic, by variable and type of informant. These tables were a fundamental element, used to define the analysis of the reform's strengths and weaknesses. Subsequently, POLICY MAKER software was used to determine the actors' roles and their links to the execution of strategies for health policies.

Table 1. Characteristics of selected states

Region	Marginalization index*	Public insurance index*	Epidemiological lag*	Indigenous population*
A	High	Low	High	High
B	Medium	Medium	Medium	Medium
C	Low	High	Low	Low

*Sources: Consejo Nacional de Población-INEGI-2000-2005. SSA, Anuarios Estadísticos sobre daños a la salud, 1998-2005. Secretaría de Salud. Salud: México 2001 - 2005. Información para la Rendición de Cuentas, México, 2006.

Finally, to validate field data and results, the Delphi technique was applied and three workshops were held with selected key personnel in each state for the presentation of results and the revision of documents related to changes in equity, financing and governance policies after health care reform.

Results

Strengths in the financing of state health systems

To analyze health system financing in selected states, it was asked among health and municipal workers about changes in the availability of resources for health services delivery associated with decentralization and reform strategies. Informant's responses identified greater opportunities in the most decentralized states corresponding to region C. Referred changes were classified as strengths (Table 2); in the way they improved financing and a greater flexibility in regulation frameworks for resource allocation/reallocation.

Greater changes were associated with recent reforms in 2002 that created the Social Protection for Health System (SPHS) in 2002. For health services informants, this activity represented new financing and resource allocation schemes, as a function of the healthcare system. In states of region C not only informants talked about innovations such as lobbing for mayor federal and state level resources allocation, but also some municipal funding was observed. A minor change in degree was identified in region A, where economic development is the poorest. Nevertheless, more resources were needed in these states; capacities to implement new schemes like region C were limited. Other strengths were directly linked to governmental capacities to develop processes with greater autonomy to determine the destination of funds and strengthen negotiations to optimize expenditures and have a more efficient resource allocation.

Weaknesses in financing of state health systems

This section describes limitations referred by interviewed informants that were classified as financing weaknesses. The most important issue was dependence on funds contributed by the federal level, particularly in the states of regions A and B. This perception was reinforced in less decentralized states, with limitations in state and municipal contributions that limited health system financing.

For the studies carried out in the states of region A, higher level of federal dependence was considered to be the characteristic with greatest weight. For the studies carried out in the states of this region, this weakness is added to the characteristic of not having knowledge of fundraising and financing funds, and to a dependence on recovery fees as a consequence of a limited implantation of the SPHS. Also, accounting systems persist that make it more difficult to keep track of resources and to have accountability (Table 3).

Strengths in equity in state health systems

Information analysis on health systems for selected states, shows an implementation of plans and programmes focused on reducing the gap of inequity in sanitary systems as strength in matters of equity. The SPHS is the one with greatest weight to be catalogued as strength.

Analysis revealed strengths in matters of equity related to the establishment of mechanisms for resource allocation for the operation and growth of the state health

Table 2. Strengths in health financing

Strengths	Regions		
	A	B	C
Diversification of financing sources	+	++	+++
Combination of financing funds	+	+	++
Favourable opinion of pre-payment	+	++	++
Growth based on goals of strategic programmes	-	+	++
Implantation of new financing sources and schemes	+	++	+++
Autonomy in spending	++	++	++
Optimization in expenditures	+	+	++
Community negotiation of resources	+	+	++
Perception that financing has broadened services production	+	+	+++
Favourable options of recovery fees	++	+	+++

High = +++, Medium = ++, Low = +, Nil = -

system, as well as the capacity to operate new reform strategies; this was more noticeable in states of regions B and C. The immediate consequence of this was an improvement in access to health services demanded by the population. In the particular case of region A, the overall characteristics in matters of equity do not have enough strength to consolidate actions towards a successful health reform, in spite of the presence of programmes for the population with high marginalization indexes (Table 4).

Weaknesses in equity in state health systems

Majority of health system informants referred limited knowledge about applying technical criteria to achieve equity. The greatest weaknesses in matters of equity refer to limited capacities with respect to the allocation of resources to cover local health needs. When this problem was more acute, the dependence on resources coming from users' out-of-pocket fees was higher, particularly in region A, where the implantation of the SPHS was more limited. Also, limitations that were derived from the lack of financial resources to satisfy local health needs of the population were reported (Table 5).

Major weaknesses on equity referred the lack of identification of opportunities that will end in a negotiation for financing and a low capacity to identify innovative financing schemes. There was a limited handling of equity as a criterion for financial allocation and of formulas oriented towards the allocation and exercise of economic resources, especially in states of region A. Decision makers of health systems established the need to strengthen state level administration of financial resources for health and the perception of operative personnel who reject or resist the SPHS, since they do not know the scope of the programme.

Table 3. Weaknesses in health level

Weaknesses	Regions		
	A	B	C
Dependence on federal level	+++	++	++
State administrative recentralization	++	++	++
Lack of knowledge on financiing sources and funds	++	++	+
Lack of strategic vision on new federal sources and schemes	++	+	-
Dependence of recovery fees	++	++	+
An accounting system which difficult funds follow-up	++	++	+
Financial difficulties due to federal delegation of responsibilities	++	+	+
Normative rigidity for financial transfers	+	+	-
Limited state contributions	++	+	+
Unfavourable options of recovery fees	++	++	++

High = +++, Medium = ++, Low = +, Nil = -.

Table 4. Strengths in equity

Weaknesses	Regions		
	A	B	C
Existences of equity indicators	-	+	++
Technical criteria in resource allocation	+	+	++
Resource allocation for the operation and growth of health system	+	++	++
Improvement in access to health services	++	++	++
Implementation of plans and programmes for greater equity (SPHS)	+	++	+++
Capacity to operate the SPHS	+	++	+++
Implementation of SPHS initiative to improve financing	+	++	+++
Programmes for health converge and access for vulnerable populations	+++	+	++
Favourable community impact of health services	+	++	++
Support for the municipalization of health services	-	-	++

High = +++, Medium = ++, Low = +, Nil = -.

Strengths in the governance of state health systems

To describe strengths in health governance, the identification of legal frameworks and regulations, the orientation of strategies for accountability and local spaces for decision-making was analyzed. Other characteristics in the states included the development of governmental abilities for health policy implementation.

Strengths reported in the three regions referred the existence of community initiatives to improve health services facilities. NGO representatives and users acknowledged of spaces for community participation linked to governmental programmes such as "Oportunidades" and to mechanisms for citizen inclusion that are exclusive to the health sector, like in the case of the health committees. Nevertheless, the communities' participation in decision-making was limited.

To a lesser degree, intergovernmental coordination was referred and the existence of mediation mechanisms to support vulnerable groups. The strengthening reported in the three regions also refers to the empowerment of users with the inclusion of new initiatives for a greater participation of citizens in health care (Table 6).

Governance weaknesses in state health systems

Governance weaknesses were related to the lack of coordination between government levels, particularly in regions A and B. Health systems informants considered certain centralismdegrees at federal and state levels, and limited

Table 5. Weaknesses in equity

Weaknesses	Regions		
	A	B	C
Limited management of equity as financial allocation criterion	+++	++	+
Limitations in state management of resources	+++	++	+
Limited handling of formulas for the use of resources	++	+	+
Out of phase with new healthcare schemes	++	+	-
Lack of capacity to operate the SPHS	++	+	+
Dependence on citizen contributions	+++	++	++
Dependence on governmental contributions	+++	+++	+
Out-of-pocket user expenditures	++	++	+++
Operative expenditures that may be a financial burden to the system	++	++	+

High = +++, Medium = ++, Low = +, Nil = -.

Table 6. Strengths in governance

Weaknesses	Regions		
	A	B	C
Identification of legal and normative frameworks	++	++	+++
Margins for local decision-making	++	++	+++
Orientation towards accountability	++	++	+++
Initiatives to promote greater participation	++	+	++
Coordination between government levels	++	+	+++
User empowerment +	+	+	
Participation in programme design and in decision-making	-	-	+
Critical vision of political corporatism with health programmes and public resources	-	+	+
Community involvement in decision-making	-	-	+
Mediation mechanisms to support vulnerable groups	++	+	++

High = +++, Medium = ++, Low = +, Nil = -.

channels to promote participation in financing and decisions related to budgetary resources.

The most reported weakness in regions A and B was that of political corporatism or a patronage system (favouritism for political parties interests), which is understood as the use of social programmes with political± electoral ends. This weakness was closely linked to limited opportunities oriented towards promoting a greater social participation in programme design and strategic decision-making. To a lesser degree, these weaknesses were also found in the analysis of region C.

Politicizing health resources and expenditures is a weakness with complex implications referred to the fact of and having as a consequence a social participation that is understood to be only within official frameworks. Federal centralism was an explicit weakness seen by health services workers in the analysis of region B. This situation explains a limited local capacity in legal frameworks as well as in their ability to move towards a reform of the state health system (Table 7).

Discussion and conclusions

Major changes in financial allocation mechanisms stemming from new technical criteria have meant a positive change in financing and equity in decentralized and more developed states. Some of these changes were observed to a lesser degree in regions A and B. These results allow us to establish opportunities of collaboration to develop capacities of local governments, community leaders, civil society, health providers and central governments. A more effective decentralization could improve equity and changes in financial resource allocation for health.

Effects of health care reform on the design, implementation and monitoring of health financing and equity policies varied among regions, depending on different levels of governance and social participation of the main political actors involved in public health services for non-insured populations in each state.

Changes in financial co-responsibility of government levels were mainly related to per capita state income, local politics, governance level and changes in resource allocation. As an endogenous variable in health system to increase health expenditures, decentralization phase was a determining variable. Some data suggest that major autonomy derived from this policy allowed changes in allocation and the usage of equity criteria.

Increases in financial sums were not closely related to per capita expenditures in health or to population's health needs. For example, in region A are the states with greatest marginalization indexes in the country; however, these are the less favoured states in terms of expenditure increases and have the lowest per capita expenditures in health. These same states also show the highest inequity indexes and the least favourable financial co-responsibility indexes. The uninsured population in this region has the highest indexes of catastrophic expenditures in health of the seven analyzed states. On the other hand, in regions

Table 7. Weaknesses in governance

Weaknesses	Regions A	B	C
Limited knowledge of legal and its scopes	++	++	+
Limited scopes of the reform	++	+	-
Federal centralism	+++	+++	+
Efficiency problems for producing health services	++	++	+
Lack of mechanisms to monitor the use of resources	++	++	+
Lack of intergovernmental coordination	++	++	+
Political electoral corporatism	+++	+++	+
Social participation limited to official programmes	+	+	+
Limited planning	+	+	-
Lack of opportunities for participation in programmes design and decision-making	++	++	+

High = +++, Medium = ++, Low = +, Nil = -.

B and C we find the states with the greatest income and also with the lowest inequity indexes in resource allocation and the lowest catastrophic health expenditures in their uninsured population.

Intergovernmental relationships for good governance and agreements between the different levels of government depend to a great extent on the political parties in power. In states where the PAN (right wing party) governs, which is the party in power at the federal level, intergovernmental relationships continue under the same structure of power, from the centre to the states and municipalities. In the states where the party in power is PRI (centralist party), which is a party that is allied to PAN in many spheres, intergovernmental relationships follow the same structure with some variance; finally, in the states where the PRD (left wing party) governs, intergovernmental relationships have been redefined, with different levels of negotiation, agreements and disagreements between the federal and state levels.

Lessons learned for the transfer of functions from the federal level to the states suggest that there is a greater probability of increasing the alternatives of financing by adding municipal resources. In this context, the level of participation achieved in each state determined the financial diversity. States with volunteer community leaders, NGO leaders and users of health services involved were the states that showed greater financial contributions by NGOs, contributions from donors, a greater increase in the economic contribution through recovery fees, a greater social participation in free manpower for the construction of health centres, and a greater impact and social commitment of health promoters.

The providers' discourse, which points to new financing mechanisms as a result of health care reform, establishes the importance of analyzing the local needs and allocating resources using technical criteria. This is important because in practice it has only been possible to implement some allocation mechanisms based on epidemiological criteria modalities, without being able to apply clinical and economic criteria, let alone accomplish full participation of users or community leaders in this process. As another effect of health care reform on new financing policies, another important finding was the contribution of community work to support the operation of health units.

On the other hand, for providers and users alike, a situation of organizational ambivalence has emerged among the three levels of government. In fact, sometimes, the level that makes the decision and takes on the financial responsibility for the allocation of resources for the different health programmes is the national level. The financial decentralization policy aims to put an end to the excessively centralist sense of government structures. However, the same findings herein presented, like the results from other studies in other developing countries (14, 15), show that in terms of health service financing, state and municipal levels still depend to a great extent on the centre, and only in region C, has it been possible to develop important changes in financing matters.

Main lessons on strengths

- After health care reform, considerable increases have been reported in health financing sums and effectiveness mechanisms for the coordination of government levels in states with higher levels of development; these changes have coincided with positive gains in some social indicators, particularly improvement in child mortality levels, maternal mortality and morbidity due to chronic and infectious diseases.
- In some states, decentralization, as a strategy in force for health reform, has generated considerable gains in terms of indexes of financial co-responsibility and co-responsibility in health production and participation. In matters of equity, there is a new formula for resource allocation, where the state level has also played a leading part in its revision, adjustments and application, to make the resources assigned by the federal level more adequate, as well as the reallocation of resources based on the healthcare model adopted by each state as a function of its needs.
- In compensation, implementation of selective prioritary health programmes directed towards the most vulnerable groups was observed in poorer states. These initiatives have made important contributions for a greater coverage of marginalized families.
- The SPHS is a financing strategy with an equity principle, where financing follows the user if he/she moves from one state to another. This is particularly relevant in a country where the internal migration of the population not belonging to the formal economy is so high.
- Participation of the different actors of the health system varied in decision-making for health. Among these actors, users of health services reported lesser levels. NGO leaders and community leaders reported major opportunities.

Main lessons on weaknesses

There was confusion among different levels of government at the time of implementing changes in financing and health service production.

Informants at municipal level manifested that the state level is the one now centralizing power. This pattern was also related by state level informants in relation with federal level actors.

Accountability at the federal level is limited to informing about the fulfilment of goals in all substantial programmes and supporting them, without relating to a countable denominator that will allow for effective accountability. In the states and municipalities, there is still an absence of a system for accountability and transparency in resource allocation.

Prioritary health programmes directed to vulnerable groups operate with a centralized management at the federal level, with effects that are contrary to the gains that had been generated by the decentralization of power and with limited effects on mechanisms for the coordination of these programmes and on benefits in epidemiological indicators for health.

Disagreements among political parties in power, in federal and state governments, were reflected on difficulties in the effective management of reform programmes.

There was scarce progress in health democratization and confusion as to the rules and roles of the different actors in the health system.

Limitations observed in poorer states suggest the need to progress in matters of equity in resource allocation for the uninsured population. In spite of the gains in financial protection, in some states users with low family income are the ones who have greater catastrophic health expenditures.

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Promoting the effective translation of the Framework Convention on Tobacco Control. A case study of challenges and opportunities for strategic communications in Mexico*

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The World Health Organization Framework Convention on Tobacco Control (WHO-FCTC) is a multilateral treaty that came into force in 2005 and promotes a coordinated, international policy response to the global epidemic of tobacco use (WHO, 2003). Countries that ratify the treaty signal intent to enact a range of best-practices tobacco control policies (see Table 1), the evidence for which came primarily from high-income countries. Distinct sociocultural and political-economic histories in low- and middle-income countries may augment tobacco policy impacts or, perhaps, render them less effective (Fong, Cummings, Borland, & Hastings, 2006; Thrasher et al., 2006). Moreover, the WHO-FCTC does not provide enforcement mechanisms to ensure adherence to the policies that it promotes, even among countries that have ratified this treaty. In recognition of these issues, the present article aims to identify the sociocultural and political-economic factors that are likely to moderate the translation of WHO-FCTC policies, from uptake to impact, in the context of Mexico. Our approach is broadly organized by the heuristic of "framing," which many social movement theorists use to understand how social and political change occurs (Benford & Snow, 2000; Keck & Sikkink, 1998).

This concept draws attention to how various social actors engage in struggles over the production and maintenance of meaning around a particular issue. Framing strategies include identifying the source(s) of blame for a problem (e.g., smokers, constituents of tobacco products, the tobacco industry) and proposing a solution to resolve this problem (e.g., educational interventions, voluntary industry policies, governmental regulation of industry practices). The primary social actors who engage in public processes of framing tobacco issues through the Mexican mass media and legal domains include the government, the medical/public health sector, and the tobacco industry and its allies (e.g., hospitality and advertising industries). Both within and across these groups, social actors may emphasize different understandings of tobacco to promote their interests.

To account for the success of any particular framing strategy, social movement researchers have developed the concept of "frame resonance" (Benford & Snow, 2000). This concept suggests that framing strategies are most likely to motivate social and political change if they "resonate" with dominant cultural values, symbols, and ideologies. For example, tobacco industry arguments against tobacco control policies in Western countries often capitalize on ideologies of individual autonomy and the right to decide. Reframing the meanings of smoking to include

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Table 1. Some key tobacco policies, current mexican law, and strategies to increase policy support and compliance

FCTC provisions	Current law	Strategies to increase support
Tax policies and, where appropriate, price policies, on tobacco products should be increased to reduce tobacco consumption. Regulate the packaging and labeling of tobacco products to ensure appropriate product warnings are communicated to consumers, e.g., rotating health warnings on tobacco packaging that cover at least 30% (but ideally 50% or more) of the principal display areas and can include pictures or pictograms. Misleading and deceptive terms such as light and mild should be banned.	• 2007, increase tax from 58.6% to 63.8% of price to consumer • 2008, increase tax to 65.2% of price • 2009, increase tax to 66.6% of price Warning label occupy 50% of the back of cigarette packages and have three rotating messages: • Smoking is a cause of cancer and emphysema • Quitting smoking reduce important health risks • Smoking during pregnancy increases risk of premature birth and low birthweight babies • "Light" and "mild" descriptors are allowed	• Earmark revenue for tobacco prevention and treatment • Stress that youth smoking is on the rise and that youth are particularly price sensitive to tax increases • Tobacco products are different from other products that people freely consume (i.e., addictive) and demand additional measures that do not apply to other products • Build on the belief that education is the key to combating tobacco use, one which demands governmental intervention • Warning labels are low- cost educational medium • Scientific evidence, including Mexico- specific data, favors graphic imagery over text only • Graphic imagery will be particularly important when communicating with youth and illiterate populations
Enact comprehensive bans on tobacco Advertising, promotion, and sponsorship Protection from exposure to tobacco Smoke in indoor workplaces, public Transport, indoor public places, and, Where appropriate, other public places	• Tobacco advertising outlawed on Television and radio • Billboards not allowed within 200 Meters of schools • Billboards maximum of 352 meters Smoking prohibited in hospitals and public buildings	• Focus on particular components of tobacco and tobacco smoke • People falsely believe that "light" means less addictive and less harmful • Tobacco advertising, promotions, and sponsorship influence vulnerable youth population • Increasingly, young women smoke at the same rate as young men • Exposure to tobacco smoke is dangerous in any amount • Focus on toxic components of cigarette smoke to make tobacco smoke dangers more salient • A high percentage of nonsmokers, including children, are involuntarily exposed to tobacco smoke • Nonsmokers have the right to breathe clean air, particularly vulnerable people • Raise awareness of policy options • Model efforts to tell smokers to not smoke in public places

its addictive nature has been critical in changing popular conceptions of tobacco use from an individual decision to a social problem. The success of this framing strategy has been helped by the emergence of the scientific discourse on addiction providing a convincing depiction of why smoking is beyond one's control.

Efforts to change policy must often reckon with powerful entities whose political and economic interests are threatened by the proposed change. The tobacco industry is the primary antagonist to tobacco control efforts in many countries, and Mexico is no exception. We briefly describe the industry in Mexico, as well as the policies and institutional supports that have so far aimed to address the issue of tobacco use. The contextual features that we describe are brought to bear on our understanding of two separate, but related, efforts: (a) strategic communication efforts to promote the adoption of key WHO-FCTC policies (i.e., taxes, warning labels, advertising bans, smoke-free areas) and (b) potential strategies to address challenges to compliance with smoke-free policies. Overall, this discussion aims to lay the foundation for comparative research on policy uptake, implementation, and impact in the era of the WHO-FCTC.

Our description of tobacco in Mexico is based on both published and unpublished research. The unpublished data mainly come from the following sources: (a) a representative sample of 1,080 adult smokers in four major Mexican cities who were surveyed in 2006 as part of the International Tobacco Control Policy Evaluation Project (ITC Project; Fong, Cummings et al., 2006), which we refer to as ITC-Mexico (for a description of the design and methods see Thrasher, Hammond et al.); (b) 10 focus groups with adult smokers from different age groups and socioeconomic strata in Mexico City and Cuernavaca, Morelos, in 2006; and (c) in-depth interviews with 46 public university students in 2003 (for a description of methods, see Thrasher & Bentley, 2006).

Mexico, the tobacco industry, and tobacco control policy

Profile of Mexico

Mexico is the most populous Spanish-speaking country in the world, with a population of 103 million (Instituto Nacional de Estadística Geografía e Informática, 2006) and approximately 10.6 million additional Mexican nationals living in the United States (Passel, 2005). Mexico is an upper middle-income country (US$7,310 per capita income in 2005); however, income inequality is high (WorldBank, 2004). The informal sector of the economy accounts for 20% to 44% of all jobs (Dalsgaard, 2000), including jobs that involve the illegal sale of contraband and single cigarettes, as well as unregulated, small-scale restaurants, bars, and other public venues that would likely elude smoke-free legislation.

The political-economic system of Mexico is in transition after more than 70 years of rule by the Institutional Revolutionary Party (PRI). In 2000, the PRI lost its first presidential election to Vicente Fox, the candidate from the right-of-center National Action Party (PAN). The PAN presidential candidate, Felipe Calderón, was elected when Fox's term expired in 2006. No political party holds the majority in the Mexican Congress. The historically strong concentration of power in the presidency appears to have weakened, and policy is increasingly legislated through coalition politics.

The tobacco industry in Mexico

In the 1980s, the PRI began to open markets to competition from foreignowned companies, a process which was consolidated under the 1994 North American Free Trade Agreement (Camp, 2007). When the tobacco market was liberalized in 1997, Phillip Morris International (PMI) and British American Tobacco (BAT) entered Mexico and control approximately 97% of the cigarette market (R. Hammond, 1998). Until 2007, Carlos Slim currently the richest man in the world held a controlling stake in Cigatam, the tobacco subsidiary that PMI had purchased. Slim's wealth equals more than 5% of Mexico's gross domestic product, and the companies he controls make up one third of the Mexican stock exchange (Mehta, 2007). His political influence is clear; however, his specific influence over tobacco policy is less well documented. He divested some of his Cigatam stock in late 2007, around the time when he announced his plans to finance philanthropic endeavors to combat poverty in Mexico and Latin America.

Tobacco companies have clearly affected tobacco policy making in Mexico. Weeks after the Mexican Congress ratified the WHO-FCTC, BAT and PMI signed an agreement with the Mexican Ministry of Health, effectively violating the WHO-FCTC guiding principle of protecting tobacco control policies "against commercial and other vested interests of the tobacco industry" (Madrazo-Lajous & Zambrano-Porras, 2007; Samet, Wipfli, Perez-Padilla, & Yach, 2006). Partly in response to

the ensuing controversy (Tapia-Conyer, Ruíz-Gaytán, & Caso-González, 2006), the Minister of Health who took office at the end of 2006 voided the agreement (Hernández-Ávila, Rodríguez-Ajenjo, García-Nadal, Ibañez-Hernández, & Martínez-Ruíz, 2007).

In the past few years, the tobacco industry has been conducting corporate social responsibility campaigns, including those that draw attention to its efforts to develop a "safer cigarette." The BAT and PMI Web sites contain information on addiction and other aspects of smoking that may help them avoid the costly lawsuits that they have faced in the United States and other countries. BAT and PMI logos appear alongside that of the Ministry of Health on materials for a national program to keep cigarette vendors from selling to youth. Such programs appear relatively ineffective but which make the industry look good (Glantz, 2002). Meanwhile, it appears that industry promotional strategies are successfully reaching the next generation of smokers. The Global Youth Tobacco Survey (GYTS) in Mexico indicates that the percentage of youth who own an object with a tobacco brand on it has increased from 16% to 21% from 2003 to 2006. In each of these years, 12% of youth reported that industry representatives had offered them free cigarettes (Valdés-Salgado, Reynales, Lazcano-Ponce, & Hernández-Avila, 2007).

Tobacco Control Policy in Mexico

A critical issue for effective translation of programs and policies concerns generating the political will to intervene. In the past 10 years, medical and public health professionals in Mexico have made the scientific case for tobacco use as a public health problem worthy of government intervention, and the Mexican government has begun to develop plans for addressing tobacco issues. Studies of the disease burden in Mexican society began to emerge in the mid-1990s, with initial reports using algorithms developed from U.S. studies of the disease-specific attributable fraction caused by smoking (Tapia-Conyer, Kuri-Morales, & Meneses-Gonzalez, 1995). However, Mexican smokers' lower intensity of smoking raised questions about the validity of these estimates. Subsequent studies focused just on lung cancer trends (Lazcano-Ponce, Tovar Guzman, Meneses-Gonzalez, Rascon-Pacheco, & Hernández-Ávila, 1997; Tovar-Guzmán, López- Antuñano, & Rodríguez-Salgado, 2005) and developing Mexico-specific attributable fractions to provide better estimates of the cost of tobacco use (Reynales-Shigematsu, Campuzano-Rincón et al., 2006; Reynales-Shigematsu, Rodríguez-Bolaños et al., 2006). Such economic data are now a key element of efforts to lobby for stronger tobacco policy (Sáenz de Miera-Juárez, Jiménez-Ruíz, & Reynales Shigematsu, 2007), and they have provided the rationale for further evolution of the national plan to combat tobacco use (Hernández-Ávila et al., 2007).

Since its founding in 1986, the Mexican Ministry of Health's National Council Against Addictions (CONADIC) has been the federal entity that addresses issues related to tobacco, alcohol, and other drugs. CONADIC's National Tobacco Action Plan (CONADIC, 2002) aims to lay the foundation for preventing tobacco use through educational efforts and treating tobacco-related diseases. Prevention activities include the promotion and certification of smoke-free places and educational mass media campaigns. Treatment activities include the expansion and improvement of existing stop-smoking clinics (Hernández-Ávila et al., 2007).

Although a regulatory focus on tobacco products and the tobacco industry has been given less emphasis than prevention and treatment, efforts are underway to promote the range of FCTC policies. Tobacco legislation in Mexico is contained in either the General Health Law or the Tax Law. At the end of 2006 when the agreement between the tobacco industry and the Ministry of Health expired the Tax Law was amended, gradually increasing the tax from 58.6% of the final price at the end of 2006 to 66.6% of the final price in 2009 (Sáenz de Miera-Juárez et al., 2007). The resulting increase in the cost of tobacco should reduce cigarette consumption, given that Mexican smokers appear as sensitive to price increases as other populations (Jiménez, Sáenz de Miera, Reynales-Shigematsu, Waters, & Hernández-Avila, 2007; Vásquez-Segovia, Valdés- Salgado, & Hernández-Avila, 2005). The General Health Law establishes regulations for printed and audiovisual advertising, promotion, packaging, and labeling of tobacco products and smoke-free regulations. Policies in these domains will need to be strengthened to meet WHO-FCTC goals (see Table 1).

Patterns and meanings of tobacco use and tobacco smoke exposure

Patterns of Smoking

Tobacco is a New World plant that in pre-Columbian times was used ritually throughout the Mesoamerican culture area (Robicsek, 1978), most of which is located within contemporary Mexico's borders. Traces of pre-

Columbian practices and beliefs still turn up in Mexico today, with tobacco oils, perfumes, teas, and hand-rolled cigars used to cure various ailments. Nevertheless, the vast majority of tobacco consumption in Mexico today is of factory-made cigarettes.

Smoking prevalence has been relatively stable from 1988 to 2002, at approximately 26% in urban areas (Campuzano, 2003; Campuzano et al., 2004). More adult males than females smoke (38% vs. 17%); however, prevalence and intensity appears to be stable or declining in males while it has been increasing among females (Franco-Marina, 2007; Valdés-Salgado, Micher, Hernández, Hernández, & Hernández-Avila, 2002). GYTS data indicate that smoking prevalence is equivalent among male and female 12- to 15-year-old secondary school students, increasing in both groups from 2003 to 2006, both for the prevalence of having ever smoked (51% to 57%) and having smoked in the previous 30 days (20% to 25%; Valdés-Salgado et al., 2007).

The intensity of cigarette consumption in Mexico is relatively low. Nationally representative data from 2002 indicate that daily smokers consumed an average of 6.4 cigarettes per day and only 5.5% of daily smokers consumed 20 cigarettes or more a day (Franco-Marina, 2007). This pattern gives some reason for optimism, because less addicted Mexican smokers could be more responsive to tobacco control policies and programs. Because light smokers still suffer higher rates of disease than nonsmokers (Bjartveit & Tverdal, 2005), even small effects on cessation because of enactment and enforcement of tobacco control policies will still affect overall morbidity and mortality.

Meanings of tobacco use

Smokers and nonsmokers alike associate smoking with health risks, particularly lung cancer (Thrasher, Hammond et al., 2007; Valdés-Salgado et al., 2007). However, the association between smoking and other health outcomes, such as cardiovascular disease, appears less widely known. Youth who believe most strongly in health risks are less likely to be smokers (Arillo-Santillán et al., 2007; Valdés-Salgado et al., 2006), and smokers who believe in health risks are more likely to intend to quit (Thrasher, Hammond et al., 2007). The perceived positive benefits of smoking, especially its tranquilizing effects, are shared with smokers in many countries (Thrasher & Bentley, 2006).

Mexicans widely associate smoking with addiction. In the ITC-Mexico survey, 83% of adult smokers agreed that tobacco was addictive, and 80% saw themselves as at least somewhat addicted to smoking. Qualitative research indicates that many smokers view daily consumption of as little as one cigarette a day as an addictive behavior (Thrasher & Bentley, 2006). The meanings that Mexicans associate with the term *addiction* are somewhat ambiguous, however, as has been found for both lay (Quintero & Nichter, 1996) and professional groups in other countries (Schaffer, 1997). In focus groups, smokers found it difficult to articulate what *addiction* meant, although a few participants with higher educational backgrounds referred to a biologically anchored compulsion to consume.

The term *vicio*, or vice, is the more common Mexican idiom for describing tobacco's hold over behavior. The religious, quasi-moralistic roots of this term tie its connotations to negative social evaluations and dangerous consequences. At the same time, *vicio* emphasizes the pleasurable element that promotes and accompanies the behavior, even if the behavior is ultimately destructive. The focus on pleasure and destruction comes up in a common saying on vice: *El que por sus gustos muere, hasta la muerte le sabe* ("He who dies because of pleasures [gustos], knows/tastes it until death"). The key to this saying is the double-meaning of *saber*, as the word for both "to taste" and "to know." In other words, those who die because of pursuing pleasures do so knowing that death will result, savoring the pleasure along the way. Aside from this connotation of "informed choice," the meanings of vice include control over and personal accountability for the behavior, according to other research in Mexico (Nuño-Gutierrez, Álvarez- Memegyel, González-Forteza, & Madrigal de León, 2006). Nuño-Gutierrez et al. (2006) found that the meanings of addiction, on the other hand, are more readily linked to "disease" and perceptions of compulsive behavior that is beyond individual control. Addiction potentially provides a stronger rationale than vice for the exculpation from responsibility, recasting the smoker as a helpless victim of biology instead of a willful pleasure seeker who knowingly chooses the manner of his demise.

Our focus group and ITC-Mexico survey data provide some support for the association between personal responsibility and smoking. Fully 85% of adult smokers agreed with the statement, "Any negative health impact that smoking causes is the smokers' fault." This sentiment was shared across smokers who participated in our focus groups in Mexico City and Cuernavaca, who almost unanimously emphasized that smoking was their decision (decisión), choice (elección), or responsibility (responsi-

bilidad) and that nobody forced them (obligar) to smoke. This emphasis on individual accountability may seem surprising in the context of what many have characterized as a "collectivistic" culture that emphasizes sacrifice of personal gain for the family or the group (L. Baezconde-Garbanati, 2004; Marín & VanOss Marín, 1991). However, collectivist orientations may be more apparent in other domains of behavior. Furthermore, this orientation has provided a focus for educational efforts to prevent smoking and promote cessation among Latinos by focusing on family-related impacts of smoking (L. Baezconde-Garbanati, Beebe, & Perez-Stable, 2007).

Second hand smoke (SHS) exposure and beliefs

Existing data indicate that SHS exposure is widespread in Mexico. In 2006, 44% of adolescents self-reported SHS exposure in their homes, and 57% reported exposure in public places (Valdés-Salgado et al., 2007). Most adult smokers who participated in the ITC-Mexico study reported that they smoke in their homes and restaurants (69% and 78%, respectively), whereas 41% smoke at work if they work in enclosed workplaces. However, studies that monitor airborne nicotine in public places indicate that smoke-free policies, where they exist, are often violated (Barrientos-Gutiérrez, Valdés- Salgado, Reynales-Shigematsu, Navas-Acien, & Lazcano-Ponce, 2007; Navas-Acien & Valdés-Salgado, 2005). In sum, there appears to be widespread SHS exposure and faulty compliance with existing smoke-free policies.

In spite of widespread SHS exposure, the dangers posed by SHS exposure appear widely recognized. For example, GYTS data indicate that 76% of Mexican adolescents believe that SHS exposure is "definitely" dangerous, whereas 15% said that it was "probably" dangerous. ITC-Mexico data show a similar awareness, with 91% of adult smokers agreeing that exposure to SHS causes lung cancer in nonsmokers. Our focus groups with adult smokers in Mexico City and Cuernavaca and interview data (Thrasher & Bentley, 2006) indicated similarly high levels of awareness about SHS dangers. At the same time, however, smokers' emphasize a countervailing emphasis on their rights to smoke. For example, ITC-Mexico surveyed adult smokers on their agreement with the following statement: "If someone does not want to breathe smoke from your cigarette, they should go somewhere else." The results were mixed, with 36% agreeing, 39% disagreeing, and 23% neither agreeing nor disagreeing. Hence, although knowledge of SHS dangers appears widespread, this knowledge does not seem to constrain public smoking behavior.

Challenges and Opportunities for Promoting the Uptake of FCTC Policies

The increasing importance of coalition building across political parties and the fragmented nature of political ideologies in Mexico suggests that successful policy advocacy efforts will be ones that have cross-cutting appeal (Camp, 2007). At the same time, policy arguments should anticipate, to the extent possible, tobacco industry arguments against such policies. In this regard, efforts to quantify the economic costs of tobacco use in Mexico and the declining importance of tobacco production in the Mexican economy (Sáenz de Miera-Juárez et al., 2007) aim to appeal to "bottom line" logic of policy making in the neoliberal era. Moreover, efforts to highlight the incongruence between having ratified the international WHO-FCTC and not taken steps to implement its provisions could "shame" legislators into taking action. Some have even proposed legal intervention to hold Mexico accountable to its international obligations (Madrazo-Lajous & Zambrano- Porras, 2007). In the end, the WHO-FCTC generally lacks any mechanism to hold countries accountable and leaves countries on their own to sort out issues with compliance. Civil society is charged with monitoring WHOFCTC implementation and holding countries accountable, which is potentially problematic in countries that either do not have a strong civil society sector or whose civil society organizations are not focused on tobacco issues or policy (Sussman et al., 2007).

Data indicating that the majority of the general population supports stronger tobacco control measures could be convincing for legislators who view their role as representing the will of their constituents. ITC-Mexico indicates that 68% of adult smokers agreed that the government should do more to combat smoking. Agreement with the need for governmental intervention was also widely held across focus groups with adult smokers; however, when asked what the government should do, focus group participants had difficulty articulating anything aside from "educate people." The tobacco industry has exploited this orientation toward education as "the answer" by promoting ineffective youth tobacco prevention programs throughout Latin America (Sebrié & Glantz, 2007). To be maximally effective, school-based education-

al approaches need to be implemented in the context of other tobacco control policies and programs that reinforce curriculum content (Skara & Sussman, 2003).

Tobacco control advocates can exploit the Mexican population's apparent emphasis on educational solutions for tobacco problems by turning it toward discussions of warning labels as an educational medium. Warning labels can be a cost-effective educational policy, particularly when the tobacco industry is obligated to bear printing costs. The scientific evidence base around warning labels increasingly supports the integration of graphic imagery into warning labels, such as imagery illustrating the health consequences of smoking (D. Hammond et al., 2007). Probably because of this emerging consensus, the 2004 tobacco industry agreement with the Ministry of Health explicitly prohibited the integration of graphic imagery into cigarette package warning labels (Samet et al., 2006). Anticipating industry arguments about the "unfairness" of such policies when applied to legal products, it will be critical for tobacco policy advocates to argue for how tobacco products are addictive and deadly, unlike other products that people can freely consume. Furthermore, advocates may capitalize on Mexican data that indicate the potential impact of graphic warnings among Mexican smokers (Thrasher, Allen et al., 2006; Thrasher, Hammond et al., 2007; Thrasher, Rousu et al., 2007). Such arguments can be bolstered by recognizing that most Mexican adult smokers want more information on their cigarette packs (Thrasher, Hammond et al., 2007) and that graphic imagery is likely to overcome issues around communicating warnings to illiterate and youth populations.

Emerging concerns for democratic governance in Mexico (Camp, 2007; Middlebrook, 2004) suggest that gauging and broadcasting popular support for tobacco policies may be an important advocacy tool. Mexicans also generally favor stronger tobacco control policies when they are asked about their level of support for specific policies. For example, the 2006 GYTS administration found that 85% of the youth surveyed supported smoking bans in public places. Another survey conducted in Tijuana found that most adults supported smoking bans in public places such as workplaces (85%), restaurants (79%), schools (93%), health centers (95%), and public transportation (90%; Martínez-Donate et al., 2005). ITC

Mexico data among adult smokers suggest similarly high support for complete smoking bans in hospitals (89%) and public transportation (87%). Support was weaker for complete bans in workplaces in general (45%) and for the particular workplaces of restaurants (30%) and bars (12%). Furthermore, 76% of smokers said they were in favor of a complete advertising ban, although only 36% were strongly in favor of such a ban. Overall, these results suggest that the Mexican population would support many of the key policies that the WHOFCTC promotes. In the end, however, popular support for policies may be less likely to promote legislation in nascent democratic societies such as Mexico; hence, more top-down-focused advocacy efforts may be critical.

Efforts to expand and/or energize public and political support for tobacco control policies will likely need to include the message that most smokers cannot control their smoking behavior. 80% of adult smokers admit as much when they say that they are addicted to smoking. In so doing, smoking may be dislodged from the domain of individual responsibility to the social domain where government intervention is required to protect its citizens. This framing of tobacco use as a biological addiction has been critical in legal and regulatory successes against the tobacco industry in other countries (Brandt, 2007; Chapman & Lieberman, 2005). Internal documents from the tobacco industry show its concern regarding the discourse on addiction: "The entire matter of addiction is the most potent weapon a prosecuting attorney can have in a lung cancer/cigarette case. We can't defend continued smoking as 'free choice' if the person was addicted" (Knopick, 1980). However, such efforts would need to be undertaken carefully, as any resulting stigma borne by smokers may mobilize them against tobacco control efforts.

Mexicans' perceptions of the chemicals that compose cigarettes and cigarette smoke may also need to be addressed to promote tobacco control policy. Focus group data among adult smokers indicate very low awareness of these chemicals beyond tar and nicotine, which are the two chemicals that are listed on cigarette packages. Formative message testing among young adults in Mexico suggests that revealing surprising toxic cigarette constituents could be a useful messaging strategy for promoting policy (Thrasher, 2005). For example, once told that cigarettes contained ammonia, one 22-year-old female experimental smoker exhibited a common reaction of imagining other dangerous substances hidden in cigarettes:

- There are many cigarette ingredients that aren't specified, so we don't really know what they put in cigarettes. And when we know what they really contain, it could be a way of taking a stand, and then trying to not consume [cigarettes].

Mass media educational and counteradvertising campaigns could aim to promote such awareness. As described earlier, an inexpensive complement could involve taking advantage of warning labels as a medium for message transmission. In other countries, tobacco prevention efforts that conjure an image of the industry as deceitful and exploitative have been used to advance tobacco control policy agendas (Department of Health Services, 1998), including those designed to prevent youth smoking (Farrelly, Davis, Haviland, Messeri, & Healton, 2005; Thrasher & Jackson, 2006). However, such efforts may be most effective in sociopolitical milieus where the tobacco industry is the target of other efforts that keep it in the popular imagination, such as was the case with litigation against the industry and relatively strong media advocacy efforts in the United States. In Mexico, litigation against the industry is nonexistent, and media advocacy efforts have been concentrated around the WHO's annual World No Tobacco Day. Other media coverage of industry practices mainly focuses on rare, scandalous events such as the tobacco industry agreement with the Ministry of Health and the industry's luxury trips for Mexican senators. As the Mexican media appear increasingly focused on scandal (Lawson, 2004), media advocacy efforts that highlight the controversial actions of the tobacco industry may be more likely to be reported (Chapman & Lupton, 1994). Such efforts to make the tobacco industry visible in the public imagination may be important in gaining popular support for regulating industry practices and products.

Highlighting the exploitative practices of the tobacco industry may channel other dominant orientations and sentiments among Mexicans as well, including the relatively universal desire to protect vulnerable populations. In the context of a family-oriented society (Marín & VanOss Marín, 1991), this strategy is most obvious in the case of children. Hence, data showing industry influence over children□ articularly a focus on their having promotional items and having received free cigarettes from industry representatives should be prioritized in advocacy efforts. Illustrating this influence will likely only confirm what Mexicans already believe□ TC-Mexico data indicate that 80% of adult smokers believe that advertising influences youth to smoke, and 76% of these smokers support a total ban on advertising. Nevertheless, such efforts should anticipate, and be ready to counter, industry arguments regarding educational efforts in schools and their campaigns to prevent the sale of cigarettes to youth, which appear relatively ineffective when implemented in weak policy environments (Glantz, 2002).

Civil society has played a critical role in tobacco policy advocacy in other countries, yet its role in tobacco policy advocacy in Mexico is unclear. The post revolutionary corporatist model of governance in Mexico, along with the centralization of power in the presidential office, generally did not allow civil society engagement in policy-making processes; hence, top-down policy making may still dominate in some areas. Nevertheless, nongovernmental organizations have advocated for change in some policy areas, such as family planning policy, which led to dramatic declines in family size and increased educational parity among younger women. The civil society infrastructure involved in these successful advocacy efforts includes professionals from a variety of backgrounds; however, civil society involvement in tobacco control is almost entirely composed of medical professionals. Medical groups are critical because they can speak with authority and garner attention for the health impacts of smoking.

Links with other sectors of civil society would expand the network of influence at both the grassroots level and among legislators. Data regarding increasing rates of smoking among young women could capture the attention of some women's groups in Mexico. Indeed, the tobacco control movement in Mexico and other parts of Latin America could exploit the existing infrastructure of activists in the area of reproductive health and women's rights at a time when funding for many of these groups is on the decline in the region.

Promotion of smoke-free policy compliance

Once tobacco policies are passed, additional steps will be necessary to ensure compliance, although the mechanisms for doing so may differ by policy. For example, compliance with tax policy and warning label legislation is likely to depend on existing government-level regulatory mechanisms. The success of smoke free legislation is of a different character, as its success appears best ensured through self-enforcement (Jacobson & Zapawa, 2001). Existing studies already indicate problems with compliance in smoke-free workplaces (Barrientos-Gutiérrez et al., 2007; Navas-Acien & Valdés- Salgado, 2005). Furthermore, as with business taxes and food preparation laws, regulatory controls associated with smoke-free legislation would not easily extend to the many eateries and other public gathering places that operate within the large informal economy in Mexico. Hence, citizen participation and expectations will likely

have a particularly important role to play in enforcing smoke-free policies.

Studies from other countries indicate that smoke-free policies are more likely to be successful when they are preceded by consciousness-raising efforts that not only sensitize the general population to the dangers of cigarette smoke but also provide them with arguments in favor of the law (Fong, Hyland et al., 2006). Such campaigns will likely be necessary in Mexico. Decisions about the content of campaign messages can be informed by California's successful SHS media campaign, which includes messages targeted toward Latinos□no st of whom are of Mexican origin.

Messages to raise awareness about SHS harms have capitalized on concerns about children, focusing explicitly on the Mexican cultural orientation *of familismo*. Familismo captures the focus on the family□o th nuclear and extended□ s the central unit of social organization (Marín & VanOss Marín, 1991), whose interest and well-being takes precedent over individual decisions (Chong & Baez, 2005; Unger et al., 2003). Increases in calls to the California Smokers Helpline among Latino parents suggest the success of campaign messages that highlight parental obligations to protect children from harm and to serve as role models for their children (Baezconde Garbanati & Stevens, 2005).

Another key cultural value to consider in efforts to promote compliance with smoke-free legislation involves the emphasis on harmonious social interactions, or what has been called *simpatía* (Baezconde-Garbanati, 2004; Chong & Baez, 2005; Marín & VanOss Marín, 1991). *Simpatía* emphasizes avoidance of disagreement with others, particularly in public, and focus groups and surveys among people of Mexican heritage in California confirm their reluctance to ask people to not smoke (Baezconde-Garbanati, Portugal, Barahona, & Carrasco, 2007). This orientation helps explain why Latinos have the highest exposure to SHS in California, even though they have the highest prevalence of home smoking bans and of smoker fathers who smoke outside the home to protect their children (Baezconde-Garbanati, Beebe, & Perez-Stable, 2007; Baezconde Garbanati, Portugal et al., 2007). However, individuals of Mexican origin also indicate that having a clear, widely understood smoke-free policy allows them to defer to the policy as beyond their control. By referring to this policy, their requests that others not smoke do not risk being seen as *antipático* or lacking *simpatía*.

Conclusion

This article has described some key issues involved in translating to the Mexican context the effective implementation of WHO-FCTC-supported tobacco control policies. In so doing, we described dominant elements of the sociocultural and political economic context that might facilitate or hinder this process. Many arguments advanced to support policies in other countries appear likely to help promote the WHO-FCTC in Mexico, including emphasis on tobacco use as an addictive behavior that is beyond the control of smokers; the need to protect vulnerable populations, particularly children, from predatory tobacco industry practices such as advertising and promotions; citizens' right to clean air and the obligation to protect them from cigarette smoke dangers; and the need to educate citizens about the dangers of tobacco use and exposure to tobacco smoke, including the use of cigarette packs as a low-cost educational medium. Research currently under way will test specific arguments in each of these domains to determine how they can be crafted to best resonate with the values, expectations, and identity concerns of different population segments in Mexico. Similar efforts in other countries would help to determine the viability of translating communication strategies and materials across borders and sociocultural contexts.

Furthermore, the present case study of Mexico should be useful in efforts to clarify which contextual features account for cross-country differences along the pathway from policy uptake to impact (Sussman et al., 2007).

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Learning from international policies on trans fatty acids to reduce cardiovascular disease in low-and middle-income countries, using Mexico as a case study

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Introduction

Policy makers are striving to identify policies that reduce chronic diseases, which have become the dominant disease burden in many less developed countries (World Health Organization 2004). Although a complex mix of behavioural, social and structural risk factors are important, policy focus is shifting 10 food in response to concern about the worldwide obesity epidemic. A range of proposed food policy initiatives include regulating marketing (Hawkes 2007) and fiscal measures (subsidies and taxation) (Mytton el al. 2007). Strategies to reduce the trans fatty acid (TFA) content of foods are also considered an important mechanism to reduce cardiovascular disease (eVD).

The objective of this study was to investigate barriers and opportunities that exist for TFA policy development in low-and middle-income countries, where the health impacts are likely to be higher because partially-hydrogenated vegetable oil is consumed in large quantities due to its low cost (Joint WHOI FAO Expert Consultation 2003; Nishida el al. 2004; Reddy and Katan 2004). This paper reviews the international literature on current TFA policies to identify potential factors for successful TFA reduction. We then present the findings of a qualitative study of contextual issues influencing implementation of TFA regulation in less developed countries, using Mexico as a case study.

Why are TFA an important public health issue?

lndustrially-produced TFA (IP-TFA) are formed by partial hydrogenation of vegetable or fish oils (Stender and Dyerberg 2003; Korver and Katan :l006) and are used 10 extend the shelf life of processed food, including fast foods, bakery products, snack foods and margarines (Mozaffarian el al. 2006).

The 2002 WHO/FAO consultation on diet and chronic diseases concluded that there is convincing evidence TFA are an independent risk factor for coronary heart disease (CHD) (Joint WHO/FAO Expert Consultation 2003). The consumption of TFA raises levels of LDL cholesterol. reduces levels of HDL cholesterol. and increases the ratio of total to HDL cholesterol (Mensink el al. 2003; Mozaffarian el al. 2006). It is estimated that decreasing calories from TFA by 2% leads to a 7% reduction in CHD mortality (Ascherio 2006). Evidence also suggests links to type-:l diabetes, sudden cardiac death, and infertility (Hu el al. 2001; van Dam el al. 2002; Stender and Dyerberg 2003; Mozaffarian el al. 2006; Chavarro el al. 2007).

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Review of current international TFA policies and regulations

We carried out a literature review of published and unpublished reports or studies of food policies and regulations which included TFA. The objective was to identify policy factors that have been important in reducing TFA content of food or TFA intake worldwide. The search strategy was designed to be used in PubMed and adapted to CAB direct and Lilacs databases. The search strategy used the MeSH terms "trans fatty acids", "health policy", "nutrition policy" and "guidance adherence". Articles in English, Spanish and Portuguese were included. This was complemented by an internet search using the Google™ search engine to locate original unpublished information or evaluations of TFA policies worldwide.

There is international policy consensus regarding the need for public health action. The 2004 WHO Global Strategy on Diet, Physical Activity and Health (World Health Organization 2004) endorsed the recommendation that TFA intake should not exceed 1% of total energy intake (Nishida el al. 20(4).

In 2007 the PAHO/WHO Task Force on 'Trans Fat Free Americas' recommended that industrial TFA should be eliminated from the food supply across the American continent (PAHO/WHO Task Force 2007). It suggested imposing TFA limits of less than 2% of total fat in vegetable oils ami margarines, and less than 5% for other foods. Other proposals include: food labelling, health claims regulation and disclosing fat content of foods supplied in restaurants and food programmes (PAHO/WHO Task Force 2007).

Despite these international recommendations, supported by member statcs, our literature review found that few national governments have implemented TFA policy. Strategies to reduce TFA cOl1sumptíon range from public health approaches such as the use of dietary guidelines and health promotion programmes, to food labelling and food content regulation and the production of alternative healthier fat sources. In this review we focus on three main approaches: regulating the amount of TFA in foods, mandatory labelling of TFA content of food, and voluntary agreements with the food industry to reduce TFA content.

Regulating the amount of TFA in foods

In 2003 Denmark became the first country to introduce regulation limiting the TFA content of foods. Initially voluntary industry action resulted in reductions in IP-TFA use. In 1994, an influential Danish Nutrition Council (DNC) scientific report, widely reported in the media, concluded that TFA had negative health impacts, particularly in high-risk subgroups of the Danish population (Stender et al. 1994). The Industrial Margarine Association responded positively with competition among its members to launch zero-TFA margarines (Astrup 2006). The DNC continued 10 exert pressure for regulation on both politicians and the food industry (Astrup 2006). Between 1992-1999, TFA content in margarines was reduced from 6 g to I g (Stender and Dyerberg 2003). Although in 2001 the mean population intake of IP-TFA was approximately 1 g/day, it was still possible 10 consume 20--30g 01' IP-TFA by eating several processed foods (Stender el al. 2006).

In 2001, despite TFA reductions, a second DNC report recommended legislation to further reduce IP-TFA (Astrup 2006). The Danish Ministry of Food and Agriculture was convinced that legislation was feasible and necessary, and ensured that it was passed through parliament and sanctioned by the EU. In 2003 the Danish Order on TFA in oils and fats carne into force (Leth et al. 2006). It imposed a maximum of 2 g TFNIOO g of oils or fats destined for human consumption (applied at the source, not in the final product)o This covers all oils and fats used in foodstuffs on the Danish market or exported from Denmark (Leth et al. 2006). The regulation also limits products claiming to be 'free from TFA' to less than 1 g TFNIOO g in the oH 01' fat used for production (Leth et al. 2006).

In 2008, Switzerland became the second European country to regulate TFA content (setting a maximum limit of 2 g TFA per lOOg of oil or fat). This followed a Federal Institute of Technology study showing that almost one-third of 120 food items tested contained excessive amounts of TFA This research was key in raising awareness of the problem among the authorities, media, consumers and food industry.

Despite lack of national US action, some cities and states have acted to regulate TFA In 2006 New York's Board of Health passed a city regulation banning the use of TFA in restaurants after finding that a voluntary programme was unsuccessful (rhe Lancet 2006; Okie 2007). By 2007, restaurants had to reduce fats containing TFA to less than 0.5 g/serving, and remove all food items from menus that exceeded the limit by July 2008 (Lcake 2007). In 2007, Philadelphia's City Council voted that restaurants must cease frying food in TFA. and in 2008 that

TFA must not be used in commercial kitchens. The law does not apply to pre-packaged foods sold.

On 25 July 2008, California became the first US state to ban TFA From 2010 restaurants will be prohibited from using oil, shortening and margarine containing TFA (California State Assembly 2008). Packaged foods, however, are not covered by ¡he ban and will continue to be permitted to contain TFA.

Mandatory labelling of the TFA content of foods

Mandatory labelling of TFA has had varying impacts on food content. In 2002, Canada became the first country to regulate the labelling of TFA. Since 2005, mandatory food labels must list the amount of TFA and saturated fats separately for most pre-packaged foods. Products with less than 0.2g TFA/serving may be labelled as 'TFA-free' (Trans Fat Task Force 2006). Manufacturers have been stimulated by this to reduce TFA f'ood content. However, there was concern among consumers and politicians that many foods still contained high TFA amounts. The Danish experience, coupled with increased awareness of the health effects of TFA in Canada-from 45% 10 79% of the population between 1998--2005 (Leger Marketing 1999, 2005)-created a climate for further political action (Trans Fat Task Force 2006). In 2004 a House of Commons motion called for a multi-sectoral task force co-chaired by Health Canada and the Heart and Stroke Association 'to provide the Minister of Health with concrete recommendations and strategies to effectively eliminate or reduce processed trans fats in Canadian foods 10 the lowest level possible'. The 2006 final report concluded it was necessary to implement a stricter regulatory approach and proposed regulations similar to Denmark (Trans Fat Task Force 2006). The Canadian Government granted the industry 2 years from June 2007 to comply voluntary before these were enforced (Health Canada 2007).

Health Canada is currently monitoring TFA content in over 400 fast food and shop-bought foods through the 'Transfat monitoring program' ro ensure industry are making significant progress towards achieving the recommendation that TFA content be less than 5% of total fat content (Health Canada 2009). Both TFA content and type of fat used in reformulation of products is being monitored. The results are published every 6 months on the internet. Data indicates that the 2005 labelling regulation, together with Task Force action and the published monitoring data, has been successful in stimulating food manufacturers to reduce or eliminate TFA. There has been progress in all food categories targeted (cookies, crackers, frozen chicken products, frozen potato products, margarines, fast-food products) (Health Canada 2009).

In the USA. the Centre for Science in the Public Interest and consumer organizations have played an important role in lobbying the Food and Drug Administration (FDA). TFA were put on the media agenda when consumer organizations filed a lawsuit against a Kraft cookic product. The FDA asked the Institute of Medicine to prepare a report on TFA and health to assist them consider potential regulations (Tarrago-Trani el al. 2006). In 1999 the FDA proposed to amend nutrition labelling regulations to include TFA when the product contains >0.5 g TFA/serving. In 2003, the FDA final ruling required mandatory declaration of the amount of TFA on labels from 2006 (Moss 2006). The ruling docs not specify maximum allowable limits but food manufacturers have already been prompted to make product changes (Tarrago-Trani et al. 2006). The FDA did not approve claims such as 'TFA free' due to concerns of trace amounts adding up with increasing servings (Lcake 2007). Despite this, the FDA still regards TFA as generally safe, causing controversy among academics and consumer groups (WilIett 2006).

Brazil and Argentina are examples of middle-income countries that have seen changes in TFA content of food, in part due 10 mandatory labelling. In December 2003 labelling regulations were negotiated and agreed in MERCOSUR, an agricultural trade agreement between five Latin America countries (Coutinho and Recine 2007). This required labels of pre-packaged foods to include amounts of TFA. This has induced some food industries 10 switch from partially hydrogenated oils to non-hydrogenated unsaturated oils at no additional costs to consumers because being 'trans free' was seen as a competitive advantage (PAHO/WHO Task Force 2007).

Voluntary reductions of TFA content by the food industry

In recent years, many food manufacturers and retailers have removed TFA from their products 'voluntarily'. The pace at which industry TFA initiatives have been adopted has varied between companies and also between countries within transnational companies. For example, in 1994 Unilever introduced a worldwide policy to remove TFA from all retail margarines and spreads (Korver and Katan 2006), triggered by media coverage that TFA were

unhealthier than saturated fats (Willett el al. 1993; Willett and Ascherio 1994; Korver and Katan 2006). In Europe, Unilever met its goal of TFA-free margarines in 3 years. However, they have been slower to implement this in other less developed regions. Fast-food chains also regularly use different fats in different areas, causing a large variation in the TFA content of products. For example, a study reported that the content of IP-TFA of one McDonald's serving varied from less than 19 in Copenhagen and Beijing 10 10 g in New York (Stender et al. 2006).

There are some examples of countries that have apparently successfully relied on voluntary agreements with the food industry. In the Netherlands, reduction of TFA has been industry-lcd (Katan 2006). A task force with representation of various stakeholders played an important role in pressuring the food industry to effective1y remove TFA from the food supply without govemment regulations or involvemcnt (Katan 2006; Willett 2006). In South Korea and Argentina, novel public-private partnerships between academics and agri-food industries have led to the production of new healthier fats or oils which are available at low cost, stimulating the food industry to replace IP-TFA in food manufacturing (Valenzue1a el al. 2004).

In Costa Rica, soybean oil was one of the principal sources of population TFA consumption. In 2000, the soybean oil industry voluntarily decreased TFA content in thcir oils. The effect of this change has been evaluated and has further strengthened the existing evidence on the association between TFA food intake and myocardial infarction (Baylin el al. 2003; Colón Ramos el al. 2006).

In the UK it is believed that voluntary industry action has reduced TFA content to below 1% in most processed foods. In 2007, the British Retail Consortium announced that major retailers including five supemlarket chains had committed to remove TFA from all branded products. Only one hydrogenation plant is now operating in the UK and that is producing flly hydrogenated oil. By December 2007, the Food Standards Agency claimed that voluntary measures to reduce TFA had already resulted in safe levels of consumer intake (Food Standards Agency 2007).

In summary, there is evidence from developed countries that it is possib1e 10 reduce the TFA content of foods through regulation and food labelling. However, there is little research examining the effectiveness of specific food policies (including those for TFA) in changing dietary intake and health outcomes. A recent WHO systematic review found that few policy interventions for improving nutrition have been evaluated in peer-reviewed studies (World Health Organization 2009). Convincing evidence of effectiveness was only found in one government regulatory policy to support a healthier composition of stap1e oil use in Mauritius (Uusitalo el al. 1996). They concluded that less convincing evidence was found for fiscal policies and point-of-purchase prompts in grocery stores, vending machines, cafeterias and restaurants to support healthier (hoices. Research is less clear for the impact of food labelling and marketing regulations on changing dietary behaviour (Cowburn and Stock1ey 2005; Hawkes 2007).

This lack of conclusive evidence of health benefits is unsurprising given the complexity of the causal pathway influencing diet and CHD risk. However, economic modeling for the Disease Control Priorities in Developing Countries project suggests that replacing the trans-fat content of food is a highly cost-effective intervention worldwide, costing in Latin America only US$40 per DALY averted compared with US$1865 per DALY averted using traditional health education approaches (Willett el al. 2006).

What are the barriers to introducing TFA legislation in low-and middle income countries?

The objective of this study was to investigate barriers and opportunities which exist for TFA policy development in low and middle-income countries where higher health impacts are likely (Joint WHO/FAO Expert Consultation 2003; Nishida el al. 2004; Reddy and Katan 2004).

Mexico was selected as a case study because it is experiencing rapid epidemiological and nutritional transition (Barquera et al. 2006), resulting in a huge burden of nutrition-re1ated chronic disease. CVD is the major cause of mortality (Instituto Nacional de Estadística Geografía e Informática 2006). The prevalence of overweight and obesity is 71.9% in women and 66.7% in men; childhood obesity has risen 39.7% in 7 years (Olaiz Fernandez el al. 2006); 26.5% of adults have hypercholesterolemia and prevalence i5 greater than 50% in some states (Olaiz-Fernandez el al. 2006). Currently, there is no TFA policy in Mexico, although there is nutrition policy on labelling and hea1th claims for saturated fats and salt (Secretaría de Comercio y Fomento Industrial 1994; Secretaría de Salud 1994), and policies being developed on advertising food to children, school food and

new labelling systems. The national dietary guidelines recommend limiting the consumption of TFA. but the consumer has no way of knowing the TFA content in foods (Secretaría de Salud 2005).

A recent analysis of commonly caten foods in Mexico reports that although sorne products are TFA-free, probably due to international reductions by multinational companies, it is still possib1e to consume high amounts of TFA in average Mexican diets (Villalpando et al. 2007). Cheaper brands tend to have higher TFA content (Villalpando el al. 2007). Although the average population intake of TFA has not been measured, it is estimated to be higher than dietary guidelines, especially in lower socioeconomic groups.

Methods

Documentary policy analysis and stakeholder interviews were conducted in July 2007 to analyse the barriers and opportunities for introducing TFA policy in Mexico. Purposive sampling was used to identify Mexican informants in key roles and sectors. Informants were selected if their role in an organization was similar to that of individuals or organizations which had important int1uence in the Danish and Canadian TFA policy experiences. Their potential power, interest and commitment to the TFA issue was assessed (Buse el al. 2005). This is summarized in Table 1. An interview schedule was developed based on ¡he review of the literature. Eight semi-structured stakeholder interviews were conducted representing the following sectors involved in food policy: National Food Regulatory Agency (FRA), Health Commission of the Senate, Health Commission of the Chamber of Deputies, Ministry of Health (prevention and health promotion), Consumer Protection Agency, National Institute of Public Health (NIPH), a food manufacturer which has reduced TFA, and a lobbying organization representing 26 food companies. Two further food company representatives refused to be interviewed. National policy documents pertinent to the subject were retrieved from official government web pages and key informants.

Interviews were carried out in Spanish, recorded and transcribed verbatim. Transcripts were analysed using thematic content analysis to identify emerging themes based on the health policy analytical model proposed by Walt and Gilson (1994). This framework acknowledges the importance of the content of policy, the processes of policy making, the behaviour of actors in formulating policy and the context within which policies are created (Walt and Gilson 1994). For the analysis, themes relating to these four broad categories were first identified from the interview transcripts which were further coded to identify barriers and opportunities for regulation, power, opinions and other emerging issues. These were compared with national policy documents and the findings of the literature review of international TFA policies.

Results

A summary of the stakeholder analysis is presented in Table 2. Emerging themes from each category are described in this section.

Opportunities for evidence-based policy: nutrition and chronic diseases on the political agenda

It was felt by the food regulating agency, by political representatives and public health researchers that the current national policy context was favourable for change due to high-level political interest in tackling the increasing national rates of chronic diseases and obesity. This was facilitated by improved communication on health issues among key stakeholders (Box 1). Health actors felt that the issue of TFA was particularly timely due to increasing international focus, and new Mexican-conducted research showing the fat content of commonly eaten foods. This provided more specific information on the issue that was directly relevant to Mexícan consumers (Villalpando et al. 2007).

Comparing TFA on public and private sector agendas

The biggest barrier that stakeholders identified was that TFA are not currently on the political agenda because the issue lacks legitimacy and public support in Mexico. This is due to a number of reasons, including poor knowledge of TFA as a policy issue among government stakeholders (see Box 3), little knowledge of or concern for TFA by consumers, and lack of profile in the media (see Box 4).

In contrast TFA were high on the agenda of the food industry representatives, with some claiming to already have internal TFA policies, and marketing 'zero trans fat' foods. As has been found internationally, the pace and extent to which each international food company voluntarily reduces TFA within a country varies considerably, with introduction of TFA-free products in Mexico lagging behind introduction in other countries (Box 2). TFA

Table 1. Stakeholder analysis for trans fatty acid policy in Mexico

Stakeholder	Power[a]	Interest in TFA policy[b]	Position[c]	Commitment to policy on TFA
Ministry of Health (prevention and health promotion branch)	Medium/High	Potentially interested. May represent savings on health care.	Neutral. Not high on their agenda, other priorities.	Low commitment
Food Regulatory Agency	High	Potentially interested. Protection of the population from a health risk factor (principal mandate of institution)	Supportive in word but not in the agenda. Support for voluntary regulation of industry.	Medium commitment
National Institute of Public Health (researchers)	Low	Very interested. Possibility to see research translated into policy	Supportive	High commitment
Large food industry	High	Potentially interested. Large financial investment in new food formulations, processes and equipment. Can be used in their favour to exploit social responsibility policy. Can be used as a marketing tool if not mandatory for all.	Opposed to mandatory regulation, supportive of voluntary regulation.	Medium commitment
Medium and small food industry	Low	Not interested. Large financial investment may lose more than it will gain. Can be used in their favour to exploit social responsibility. Can be used as a marketing tool if not mandatory for all.	Opposed	Low commitment
Health commission of the Senate	High	Potentially interested Pressure to develop health policy. May lose popularity with industry. Potentially interested	Neutral. Not on their agenda.	Low commitmen
Health commission of the Chamber of Deputies	High	Pressure to develop health policy. May lose popularity with industry.	Neutral. Support for nutrition policy not for specific TFA regulation.	Low commitment
Consumers	Low	Interested. Healthier food, everybody can benefit	Potentially supportive. Not currently involved in issue.	Low commitment

Notes:

[a] Power: the ability to achieve a desired outcome or having power over others.

[b] As seen from authors´ point of view.

[c] Position reflected in interviews.

are not high on the agenda of smaller food companies, who were al so more resistant to discussing the issue.

Knowledge of health impacts of, and interventions to reduce, TFA

Knowledge of the health impacts of TFA among powerful stakeholders, consumers and the media is poor, with confusion about how TFA affect healt and their important impact on population health in Mexico (Box 3).

Virtually all stakeholders (including some from the health sector) were unaware about the range of different policy options, including labelling and regulation, that had been used effectively elsewhere in changing population TFA intake. This was despite similar types of policy intervention already being implemented in Mexico but for other purposes (e.g. regulation for nutrient content claims and nutrient comparative claims for saturated fatty acids), and two political initiatives for labelling of TFA in foods which had been proposed nationally. Of these, one had been discarded after a change in the 1cgislature due to a high number of pending initiatives. There seemed to be little political support for the second one.

Table 2. Summary of results of the Mexican stakeholder analysis

Context	Content	Process	Actors
• Nutrition and chronic diseases became an important part of the political agenda only recently (last 6 to 10 years) • Good communication channels exist (forums and round tables) among policy makers and other stakeholders. • TFA have only been mentioned superficially in forums; the issue is not on the political agenda. • TFA have no support from any specific organization. • TFA are present in the large industry´s agenda. • The large industry is implementing voluntary regulation and carrying out information campaigns. • There was no mention or acknowledgement of PAHO´s recommendations or WHO global strategies.	• Knowledge about TFA among stakeholders is very variable. There is skepticism of the evidence and concern about lack of country-specific information. • Issue of TFA is not visible among most consumers or health professionals. • There has been some media coverage of the issue led by industry that has self-regulated. • There is no consensus and poor information regarding effective policies to regulate TFA. • Voluntary regulation by the most stakeholders. • Claims and labelling were referred to in general terms, not specifically for TFA. • There is a belief that the current labelling system (based on Codex Alimentarius) is not useful for the Mexican population.	• Initiative for a regulation is the responsibility of the Food regulatory Agency (FRA). • The FRA is pressured by the Ministry of Health, the industry, consumer groups and researchers. • Consumer groups are practically non-existent. • Pressure is thus unequal from different sides. • Poor credibility of political process and concern about lengthy process among the industry and researchers. • Policy initiatives on TFA have been discarded due to change in legislature and overload of pending initiatives.	• Apparent different positions and attitudes towards TFA by sector. • Companies that have modified their products to contain less or no TFA are in favour of a national regulation. • Companies that have not changed are resistant to talk about the topic. • There is confusion among some actors who mentioned both voluntary and statutory regulations. • Some actors are keen to avoid ´punitive´ regulations for the industry. • Large industry is well organized and forms a strong lobbying group. • Medium and small industry is organized but is less active in lobbying. • The consumer protection agency is a government body that acts on behalf of consumer interests but has little participation from civil society. They do not have a position on the TFA issue.

Less surprising, perhaps, was a lack of knowledge about international TFA policy recommendations such as the PAHO report (PAHO/WHO Task Force 2007). Disappointingly. None of the actors could identify current policy opportunities or levers to take TFA regulation forward (despite. for example. existing work on new labelling schemes).

The lack of awareness in Mexico among non-health stakeholders of the importance of TFA and health, and international recommendations on TFA, was seen by health stakeholders as both a barrier, but also as an opportunity. as it was felt that these policy and research documents could be circulated to raise TFA onto the political agenda.

Consumer knowledge as a perceived barrier

Specifically, lack of consumer knowledge about TFA was perceived as one of the major barriers to policy change in Mexico. Consumer and health sector informants feel that the issue of TFA in food, and its health importance, is not visible to consumers. Furthermore, these same informants feel that poor knowledge and understanding of food and health issues by consumers, together with low literal)' rates in sorne low-income group" means that the current food labelling system may not be the most effective tool. This is clearly a barrier to the potential use of labelling as a means to reduce TFA content of food (Box 4).

Statutory versus voluntary industry action

There was no consensus regarding the appropriateness of different policy options for the Mexican context, with most non-health informants focusing on the use of voluntary approaches (e.g. to labeling. TFA food content) (Box 5). Only two actors in this study supported statutory regulations. This included a public health researcher, but more surprisingly the food industry representative that ha voluntarily started changing is processes (and thus would be likely to have a competitive advantage by being able to meet any new legal requirements quickly).

Many stakeholders, mainly the politicians and food industry informants, were not supportive of legislative measures because they felt that voluntary initiatives should be tried first to avoid political battles between

stakeholders and long regulatory processes to enact such laws. One government stakeholder commented that voluntary agreements save resources which would otherwise have to be spent in monitor´ing implementation of regulation (Box 5). The costs to the medium´sized and small companies of reformulating their products and changing processes was mentioned on several occasions as a barrier to introducing maximum permissible levels of TFA in food (Box 6, comments 2 & 3).

These findings are unsurprising. Food industry representatives have been against the implementation of mandalory lrans fat laws in many other countries including Brazil (public consultation number 65/2003 regarding the proposed law for food labelling of prepacked foods in Mercosur), which is predictable considering the conflict of interests with the proposed law. Agriculture and food policy debates have focused on market liberalization, and thus governments have tended to favour voluntary industry approaches despite potential impacts to nutrition and health (Rayner et al. 2007).

Other perceived barriers to statutory regulation

In addition to the direct comparison between voluntary versus statutory approaches for TFA action, it was fell that there are competing health policy agendas in Mexico which currently prioritize other nutrition issues. Policy makers and the government sector currently emphasize the need for comprehensive policies to tackle the burden of chronic diseases. They do not dismiss including TFA regulation in a wider policy but seem to be reluctant to support it as a separate issue (Box 6, comment 1).

Box 1. The opportunities for evidence-based health policy

- [Chronic diseases] had no visibility, the problem grew excessively without there being an organised social response. Now in this period of six years there is important concern for coming up with solutions for the problem on several fronts. (public health researcher).
- There is good relationship between academia and the policy makers which is getting even better. It used to be that the two areas were completely disconnected. (Food regulatory agency).

Box 2. TFA on the industry's agenda

TFA in this company have been present on the agenda for more than 15 years. In other countries we have marketed products that are free of TFA for a long time. In Mexico the policy started in 2002 but in 2005 we were on of the first countries in Latin America with margarines free of TFA. Throughout this time we have been including other types of products [...] There is no deadline unfortunately; we wold like to have all our productos free from TFA as soon as possible. (Food industry representative)

Box 3. Knowledge of health impacts of TFA

- As a scientist, I consider the evidence is sufficient. But the question is, is the evidence well distributed in Mexico? The answer is no. (Public health researcher).
- No, I don't think there is enough evidence. I think we are still missing a lot in many aspects, especially national evidence. (Policy maker).
- I believe there is very good information and sometimes a bit exaggereated [...] but it is clear that there is enough evidence to take regulatory action. (Food regulatory agency).
- Consumption of TFA in excess can damage health [...] but I think it is like everything, not because something has TFA they are poisoning you, it depends on how much you are consuming [...] if some foods have TFA nothing is going to happen as long as you have a balanced diet. (Consumer protection agency).

Box 4. Consumer knowledge as a perceived barrier

- Unfortunately, not Orly does the consumer not know about TFA, but health professionals don´t know either. (Food industry representative)
- Very few people understand what the nutricional information means here in México. Sometimes it is declared like a trend (…) sometimes the information is read but the consumer doesn´t know what he can do with it. (Consumer protection agency)
- If a regulation on labelling was promoted, it would have to be accompanied by a mass media campaig about the health effects of TFA. Consumers then might change their purchasting patterns …(Food industry representative)

Box 5. Supporth for voluntary industry regulation

- My proposal is that the less laws the best. I am advocating for a voluntary regulation from de industry to adopt maximum permissible levels. (policy maker)
- Having voluntary regulation is alwayas good because it helps and limits the resources that you have to spend to watch in observance. (Policy maker)
- We are still far from making a norm to regulate TFA. I think the Food Regulating Agency is hoping for a voluntary regulation from the industry and no need for them to regulate. (Government)
- We are getting ahead in Mexico TFA are an elegante. We should have done other things before in our labelling system, school foods (…) we belive it is positive that the industry self-regulates. (Government)

Box 6. Other percived barriers to statutory regulations

1. (…) the problem should be tackled in an integral way not regulate exclusively against a type of nutrient. (Policy maker)
2. (About a regulation on maximun permissible level) it is feasible but you need a very large investment. Maybe for our competition and the food industry in general it Could be complicated. (Food industry representative)
3. What we do is weig how much do we want r can take away TFA against how much it will cost the industry and how feasible it is to do it without punishing their productive system … (Food regulatory agency)

Discussion

There has been very little analysis on the actors, processes and context of TFA regulation to attempt to understand how TFA consumption can be effectively reduced.

Policy analysis shows that approaches to reduce TFA content vary between countries. Voluntary action from the food industry, often following food labelling and/or consumer pressure, has been introduced in Costa Rica, Brazil, the UK and the Netherlands. However, voluntary agreements have had varying levels of success. Canada currently has a voluntary approach to limit TFA content but the government have announced that regulations will be enforced within 2 years unless industry complies. Failure of voluntary agreements has led to implementation of strict regulations on food formulation or total prohibition in Denmark and New York. Surprisingly, most Mexican stakcholders were supportive of the use of voluntary industry regulation. This seems politically naive having considered the lack of impact that this approach has had on TFA content in other countries without external pressure, such as labelling laws and strong lobby groups, and the lack of action taken by the food industry over other voluntary agreements such as the marketing of food to children (Hawkes 2007). Food companies are well represented in food policy arenas worldwide and are unlikely to support policy that conflicts with their immediate financial and marketing position, unless they can see a competitive advantage (Lang and Heasman 2004).

In virtually all national policy experiences, there was acknowledgement of the important role of research linking TFA with ill-health, and of its awareness by decision makers and the wider population. Although this seems to be an obvious and important step, it is unlikely to be sufficient for moving policy forward. as seen in Switzerland. A recent qualitative study showed that potential barriers existed in Costa Rica for the translation of evidence into policy, the most important of which included the lack of awareness of in-country scientific studies on the heath effects of TFA, as well as the lack of consensus or information about policy options (Colón Ramos et al. 2007). This is consistent with our findings amongst Mexican stakeholders.

Very few countries see TFA as a health protection issue requiring po!icies regulating food content. Most of the countries with regulations on content or labelling are high income, where there is greater awareness of health, social and economic impacts of unhealthy diets. The context in low-or middleincome countries such as Mexico appears to be different, as discussed by various stakeholders in this study. Consumer awareness of nutrition and health effects of food including TFA is low. The impact of potential regulations may differ in les s developed countries. For example, if TFA labelling and health claims legislation are introduced, this may only have a very marginal public health impact, potentially increasing health inequalities, especially in households with low literacy rates or low food budgets.

The power of different stakeholders varies within and between countries. Although the range of actors involved in TFA policy in different countries has varied, lobbying a mi advocacy (from health. academic or consumer groups) has been consistently important. In Mexico, consumers are not as organized and thus are perceived to have little or no power. In contrast, in Mexico and similar to other countries, the largest food industries form ¡¡ powerful lobbying group which historically has been central in influencing nutrition and food policy. Most of these multinational companies have worldwide TFA reduction policies and have introduced them in other countries. There has been little international discussion about why these product formulation differences occur, and the increased health inequalities that will result, particularly in lower income countries that have not created pressure on industry.

A partnership between all stakeholders that represent consumer interests is required in Mexico. However, it is important that academic and professional bodies represent public health and not industry interests.

Conclusion

CHD is a leading cause of death in low-and middle-income countries. There is convincing epidemiological evidence that small reductions in TFA intake would reduce both CHD incidence and mortality. International organizations agree that the evidence linking TFA with CVD is strong enough to warrant public health action. Early evidence of the impact of such policies shows they are feasible to introduce and can be effective at reducing TFA content in food, and potentially intake and disease burden, in short time frames.

There are few reports of low-to middle-income countries adopting regulations to reduce the TFA content of foods. This study has explored the potential context, process and actors of introducing such policy in Mexico. Although the case oC Mexico may not be generalizable to other countries, especially those with different food cultures, many countries undergoing a nutrition transition are likely to identify similar policy scenarios and barriers to change.

Reducing TFA and replacing them with healthier alternatives in the food chain is a complex multi-sectoral issue that requires action and collaboration by government, public health, science, NGOs and industry. Successful elements required for implementing TFA policy appear to include a consistent evidence based message not only on health effects, but also on successful policy options, media coverage and consumer awareness, champion organizations such as consumer groups who can lead stakeholder partnerships, and government involvement maintaining pressure on large multinational and national food companies (for example, by voluntary or statutory action on food labelling or content).

The evidence of the need for policy on TFA is clear and consistent. The challenge is convincing policy makers that the issue is feasible, cost effective and a public health issue worth tackling.

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Análisis político del Programa de Control del dengue en Morelos, México*

Rev Saúde Pública

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La reemergencia de la fiebre del dengue (FD) y sus manifestaciones más graves (fiebre hemorrágica ± FH, síndrome de choque por fiebre del dengue SCD), reflejan dramáticamente las consecuencias del crecimiento urbano, el colapso de los servicios públicos (agua y saneamiento), el debilitamiento de los programas de control de vectores y, en alguna medida, fenómenos climatológicos extremos.[3,5-7] La fiebre del dengue es la enfermedad vírica transmitida por un mosquito del género Aedes, de elevada prevalencia a nivel global y con impacto epidemiológico, social y económico.[4-6,8,9,a] La Organización Panamericana de la Salud (OPS) ha calculado que 2 mil 500 millones de personas viven en áreas de riesgo; 50 millones de personas se infectan anualmente y más de 500 mil contraen la forma más grave de la enfermedad: la FHD.[10,b]

Para atender la emergencia, la Organización Mundial de la Salud (OMS) y la OPS10,b establecen cuatro principios orientados a mejorar las políticas de salud y el desempeño de las medidas de prevención y control de la fiebre por dengue:

- la voluntad política de los gobiernos
- coordinación intersectorial
- participación activa de la comunidad y
- el fortalecimiento de las leyes sanitarias.

Entre estos componentes, los dos primeros implican, fundamentalmente, desarrollar políticas públicas e implementar programas sectoriales e intersectoriales, planeación de finanzas, formación de recursos humanos y organización de campañas mediáticas intensivas de comunicación de riesgos. La estructura fundamental de la prevención y control de la FD/FHD gravita sobre el sector salud, con un papel protagónico en tareas de vigilancia epidemiológica, entomológica y ambiental, donde es imprescindible la capacitación del personal y la coordinación con otros sectores. La ejecución de estas políticas requiere de la cooperación entre niveles de gobierno en el cumplimiento de la legislación que sustentan los programas de control y prevención. La experiencia indica que la participación activa de la población en el saneamiento de viviendas resulta fundamental, particularmente en la eliminación de criaderos del mosquito vector. Estos principios están dirigidos a fortalecer la gobernanza mediante la atención coordinada a las necesidades de agua y saneamiento, promoviendo la configuración y coordinación de la acción gubernamental, que debe ajustarse a la rectoría y equilibrar el ejercicio del poder e interés común.[1,12]

En el año 2003, el Consejo Directivo de la OPS/OMS aprobó la resolución CD44R9 que promueve cambios en el enfoque de los programas nacionales de control del dengue.[10,b] Esta resolución destaca la gestión integral y mayor responsabilidad en la planificación y ejecución de

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actividades: vigilancia epidemiológica (reporte de casos sospechosos y confirmados), diagnóstico de laboratorio y confirmación oportuna, vigilancia entomológica (búsqueda activa del vector y su bionomía), vigilancia ambiental (e.g., agua y saneamiento) y comunicación de riesgos.[c,d,e]

No existen investigaciones en México que describan las barreras operativas desde la perspectiva de los actores involucrados en programas de vigilancia y control de enfermedades transmitidas por el vector. El objetivo del presente estudio fue analizar medidas municipales implementadas para el control de la epidemia del dengue, sobre todo las de coordinación sectorial, gobernanza y participación de grupos sociales.

Métodos

Realizamos un estudio descriptivo, utilizando técnicas de análisis político, enfocado a las agendas de gobierno relativas al programa de control de la FD y FHD en el estado de Morelos, México. Seleccionamos tres municipios de la localidad (Cuernavaca, Jojutla y Cuautla) en función de sus tendencias históricas de brotes de dengue y sus complicaciones, registros de densidades vectoriales y cobertura de servicios públicos básicos (agua potable, recolección y disposición final de residuos).

Empleamos procedimientos de evaluación rápida (rápida ppraisal procedures RAP) y análisis político.[11 14,f] Revisamos la legislación relativa a la coordinación intersectorial y de participación comunitaria, elaboramos las guías de entrevista y realizamos observaciones directas. Las entrevistas eran semiestructuradas y dirigidas a informantes clave, haciendo énfasis en las tareas de coordinación intersectorial y en las respuestas a brotes de enfermedades transmitidas por vector.

Definimos como informantes clave a los actores en condiciones de influir en la conducción de políticas públicas o asignación de recursos y, por lo tanto, con influencia en los sectores de salud y medio ambiente. Realizamos visitas a los tres municipios y of cinas de gobierno, donde llevamos a cabo observaciones directas y no participativas, para evaluar el cumplimiento o desempeño en las tareas de vigilancia y control. El universo de estudio estuvo integrado por 29 informantes clave, estratificados de acuerdo al nivel de gobierno (estatal, jurisdiccional, municipal y local) y en función de su participación operativa en actividades de comunicación de riesgo, promoción de la salud y saneamiento ambiental, planeación, capacitación y ejecución de tareas de vigilancia y control epidemiológico.

Las entrevistas fueron grabadas, exceptuando algunos casos donde sólo se tomó nota, por exigencia de los informantes. La información fue codificada de acuerdo a los temas de interés y vertida en tablas de contenido. Siguiendo Bossert, 2 elaboramos una escala con valores asignados a las variables analizadas (e.g., empleo de recursos, conocimiento del marco legal, capacitación y cumplimiento de actividades de vigilancia, prevención y control), aplicando los siguientes criterios: +++ calificación óptima; ++ regular; + valor bajo o limitado.[11,f]

Este tipo de métrica ha sido aplicada en el análisis de políticas de reforma de salud.[11,f]

El análisis de rectoría del sistema de salud fue realizado a partir de la revisión de políticas referentes al control del dengue (Ley General de Salud, Ley Estatal de Salud, la Norma Oficial Mexicana-032-SSA2-2002,[c,d,e] el plan de desarrollo estatal[g,h] y planes municipales de desarrollo de Cuernavaca,[i,j] Jojutlak y Cuautlal,[m]).

La revisión del marco legal contiene disposiciones normativas que establecen grados diferenciables de responsabilidad intersectorial, desde el ámbito federal hasta el municipal. Sin embargo, la aplicación de este marco tiene expresiones operativas más claras en el sector salud estatal, en comparación, por ejemplo, con los sectores de salud, agua y saneamiento municipal.

Utilizamos el programa de cómputo Policy Maker como herramienta auxiliar[11,14,f] que permite ordenar electrónicamente la información a partir de procedimientos puntuales, por ejemplo, mapeo e identificación de actores políticos, dependencias y programas, definición de objetivos de la agenda política, conocimiento del marco legal, tareas de respuesta frente a los brotes de enfermedades transmitidas por vector, identificación de barreras y oportunidades.

Finalmente, realizamos el análisis de estrategias tomando como marco de referencia las perspectivas de los informantes y sus recomendaciones.

Este estudio fue revisado y aprobado por los comités de investigación y ética del Instituto Nacional de Salud Publica de México (número do protocolo 7916-A1 SALUD-2002-C01) en Septiembre 2007.

RESULTADOS

La política y sus actores

La Tabla 1 muestra el grado de involucramiento y poder de los actores, respecto a las políticas de control y prevención del dengue.

Tabla 1. Involucramiento y poder de los actores respecto a las políticas de control y prevención del dengue. Morelos, México, 2007

Ámbito	Actor	Involucramiento	Poder
Estatal	Servicios de Salud	+++	+++
	CEAMA	+	+
Jurisdiccional	Jurisdicciones de los Servicios de Salud	+++	+++
	Hospitales de Referencia	++	++
Municipal	Salud Municipal	+++	+++
	Saneamiento y limpieza municipal	++	++
Local	Ayudantías	+	+
	Comunidad	++	++

Escala: +++ Alto; ++ Medio; + Bajo
CEAMA -Comisión Estatal de Agua y Medio Ambiente

Una vez que definimos el poder en función de recursos otorgados a las actividades de prevención y control del dengue, observamos que los servicios de salud brindan mayor apoyo financiero y recursos humanos, a diferencia de lo que aportan otros sectores en tareas de control larvario, nebulización y saneamiento (e.g., patio limpio).

Encontramos que dicho apoyo no es homogéneo entre los diferentes municipios afectados por el dengue.

Detectamos un vacío central en el conocimiento de la normativa relativa a la coordinación intersectorial. Asimismo, se evidencia que los sectores de agua y saneamiento municipal, ayudantías municipales y la propia comunidad, asumen de forma errónea que los servicios de salud son los únicos responsables de la prevención y control del dengue.

El grado de cumplimiento de actividades preventivas y de control de la epidemia es presentando en la Tabla 2. Las actividades de saneamiento y limpieza tuvieron desempeños deficientes a nivel municipal, a pesar de que estas actividades tienen un impacto positivo en el empoderamiento de la población y, eventualmente, fortalecen el impacto de intervenciones comunitarias dirigidas a la eliminación de criaderos de mosquitos. La causa de esta deficiencia, en los ámbitos estatal y jurisdiccional, es la participación limitada de las comunidades más afectadas por los brotes de dengue en las actividades que desarrollan los servicios de salud.

Los informantes de los servicios de salud reportaron un cumplimiento satisfactorio en funciones relacionadas con la normatividad, planeación y ejecución de acciones en el ámbito jurisdiccional y municipal. Observamos una situación diferente entre otros sectores, por ejemplo la Comisión Estatal de Agua y Medio Ambiente (CEAMA), los servicios de saneamiento municipal y la propia población de las comunidades, quienes mostraron un bajo cumplimiento en actividades de prevención.

Áreas de oportunidad

En la Tabla 3 se muestran las oportunidades para el fortalecimiento de las políticas públicas y programas de control del dengue, una vez identificada la débil participación de sectores externos a los servicios de salud. Tomando en cuenta el involucramiento en las políticas, nuestros resultados sugieren un alto grado de factibilidad operativa para el sector salud, tanto a nivel estatal, como en el ju-

Tabla 2. Perspectiva de los actores sobre el grado de cumplimiento de las funciones de control y prevención del dengue. Morelos, México, 2007

	Ámbito/Tipo de actor							
	Estatal		Jurisdiccional		Municipal		Local	
Función	Servicios de Salud	CEAMA	Jurisdicción de los Servicios de Salud	Hospitales de referencia	Salud Municipal	Saneamiento y limpieza municipal	Ayudantías	Comunidad
Rectoría efectiva	+++	+	++	++	++	+	+	+
Voluntad política de los gobiernos	+++	+	+++	++	++	+	+	+
Coordinación intersectorial	++	+	++	++	++	++	++	+
Participación de las comunidades	+++	+	+++	+	++	+	+	++

Escala: +++ Alto; ++ Medio; + Bajo
CEAMA -Comisión Estatal de Agua y Medio Ambiente

risdiccional y municipal. En el terreno de la vinculación intersectorial, establecimos un nivel medio, resultado del desconocimiento u omisión de responsabilidades legales por parte de los demás sectores. En cuanto al sistema de registro de casos probables y confirmados de dengue, asignamos un grado medio de factibilidad al personal de salud, ayudantes municipales y a la comunidad, en virtud de su limitada participación en actividades de vigilancia epidemiológica.

Los retos

La Tabla 4 presenta los principales retos identificados a partir del análisis de la normatividad vigente, agendas de gobierno, planes de desarrollo estatal y municipal, liderazgo de los actores, definición de funciones y tareas relativas al control y prevención del dengue. Entre los principales retos detectados destacan los cambios y trasferencias de personal capacitado, que dificultan el seguimiento de

Tabla 3. Grado de factibilidad de acciones de oportunidades para el control y prevención del dengue según ámbito. Morelos, México, 2007

	Ámbito/Tipo de actor							
	Estatal		Jurisdiccional		Municipal		Local	
Función	Servicios de Salud	CEAMA	Jurisdicción de los Servicios de Salud	Hospitales de referencia	Salud Municipal	Saneamiento y limpieza municipal	Ayudantías	Comunidad
Vinculación para optimizar de recursos y cumplir objetivos	+++	++	+++	++	+++	++	++	++
Notificación inmediata de casos	+++	NA	+++	+++		NA	++	++
Establecimiento de acuerdos y diseño de estrategias	+++	++	+++	+	+++	++	+++	+
Eficiencia en los procesos de recocción, disposición de residuos y eliminación de criaderos	+++	+++	+++	+	+++	+++	+++	+++
Establecimiento del dengue en la agenda de gobierno	+++	++	+++	+	+++	++	++	+
Capacitación adecuada	+++	+	+++	+++	+++	+	+	++

Escala: +++ = alto; ++ = medio; + bajo; NA = No Aplica

Tabla 4. Grado de factibilidad de retos para el control y prevención del dengue. Morelos, México, 2007

	Ámbito/Tipo de actor							
	Estatal		Jurisdiccional		Municipal		Local	
Reto	Servicios de Salud	CEAMA	Jurisdicción de los Servicios de Salud	Hospitales de referencia	Salud Municipal	Saneamiento y limpieza municipal	Ayudantías	Comunidad
Seguimiento a convenios intersectoriales	+	+	+	+	+	+	+	+
Cumplimiento de responsabilidades legales por parte de los actores	++	+	++	++	+	+	+	++
Separación de funciones y responsabilidades de salud	++	+	++	++	++	+	++	+
Vinculación entre sectores	+++	++	++	++	++	++	++	++
Eficiencia en la socialización de información	+++	NA	+++	++	++	NA	NA	NA

Escala: +++ = alto; ++ = medio; + bajo; NA = No Aplica
CEAMA -Comisión Estatal de Agua y Medio Ambiente

convenios intersectoriales y acuerdos de implementación. Algo similar observamos entre las autoridades municipales y estatales. Estos retos se corroboraron durante las visitas de campo y verificación de informes epidemiológicos, precisamente en la época de mayor descenso en las actividades de control y prevención del dengue, por un lado, e incremento de casos y brotes, por el otro.[n]

La falta de claridad en tareas de abastecimiento de agua y saneamiento ambiental que, desde el punto de vista legal, deberían asumir la CEAMA y la población local, aparecieron constantemente como grandes desafíos. Detectamos múltiples contradicciones y duplicidades operativas en los contenidos de Leyes de Salud Federal y Estatal, que se traducen en un bajo grado de factibilidad para el cumplimiento de funciones y responsabilidades de CEAMA y la comunidad.

El reto con mayor nivel de factibilidad de sortear dentro del sector salud apunta a la difusión de información, canales de comunicación y mensajes pertinentes para la población y acceso a herramientas tecnológicas existentes. El involucramiento y liderazgo de actores de los servicios de salud parecen favorecer la vinculación y coordinación entre actores del mismo sector. Esto último quedó reflejado en un nivel medio de factibilidad para la vinculación y coordinación entre estos actores.

Discusión

El análisis de las políticas del programa de control del dengue apunta hacia la débil rectoría en el desarrollo de tareas intersectoriales, con sobrecarga de actividades al sector salud e implicaciones desfavorables en términos de recursos financieros y humanos para este sector. La debilidad institucional, según este análisis, involucra a otros servicios públicos (abastecimiento de agua y saneamiento a nivel municipal), e incluye una lista de omisiones operativas en tareas de control vectorial, notificación de casos sospechosos y confirmados de dengue. Estas omisiones y debilidades explican, en alguna medida, la ausencia relativa de la población local en actividades de eliminación de criaderos del mosquito vector. La suma de debilidades institucionales y sociales ha dado como resultado el panorama epidemiológico del dengue en el estado de Morelos en los últimos diez años.

El cumplimento de los niveles de responsabilidad diferenciados permitiría mayor transparencia y mejor desempeño dentro de las respectivas esferas de competencia y niveles de gobierno. Aun cuando las disposiciones legales vigentes indican claramente que el control de vectores es una responsabilidad municipal, no existen, hasta la fecha, mecanismos que garanticen el cumplimiento de marcos normativos en términos de participación financiera y operativa desde una perspectiva intersectorial.[2,12] Hasta donde sabemos, las observaciones vertidas en este estudio representan un aporte original en el análisis de políticas del programa de control del dengue en nuestro país.

A pesar de que el personal de salud municipal tuvo formalmente mediana influencia sobre las actividades de control y prevención del dengue, la implementación de estas tareas se lleva a cabo por el sector salud a nivel jurisdiccional, aun cuando este nivel no dispone de autonomía real para decidir al respecto.

Por otro lado, en la formulación de oportunidades, la existencia formal de marcos normativos podría reforzar operativamente la coordinación intersectorial en el programa de control de la epidemia, particularmente en términos de rendición de cuentas, logro de resultados y efectividad en actividades de protección a la salud.

El enfoque adoptado en este trabajo ha documentado un peso excesivo de las actividades del programa de control del dengue sobre el sector salud. Una situación similar ha sido reportada en Cuba y otros países afectados por la epidemia.[15] En consecuencia, señalamos la urgencia de impulsar una estrategia integral, que vincule políticas públicas con una oferta de servicios de salud y que promueva la participación social, dirigiendo los recursos disponibles hacia las poblaciones más vulnerables.[15-17]

Siguiendo esta perspectiva y basado en los principios propuestos por la OMS/OPS y el Programa Nacional de Salud,o las recomendaciones propuestas en la Figura 1 permitirían: a) reducir sensiblemente las densidades de mosquito Aedes y factores de riesgo de transmisión del dengue; b) reforzar el sistema de vigilancia epidemiológica, mejorando las capacidades del laboratorio, diagnóstico y tratamiento de los casos; y c) optimizar los procesos de comunicación, dentro y fuera de los sectores, para el intercambio de información en tiempo y forma. Asimismo, mecanismos de rectoría efectiva y rendición de cuentas deben dar transparencia y sustentabilidad a las actividades de prevención y control de brotes de dengue en estas comunidades.

Nuestra propuesta de vinculación entre actores que podrían fortalecer el programa de control y prevención del dengue, las áreas de oportunidad mas sobresalientes, están representadas en la Figura, como:

- Vinculación intersectorial entre actores ajenos al sector salud estatal, jurisdiccional y municipal, de mane-

ra sobresaliente: CEAMA, saneamiento municipal, ayudantes municipales y la propia comunidad.
- Fortalecimiento del sistema de detección, diagnóstico y notifi cación de casos, por parte de todos los actores, incluyendo la comunidad.
- Involucrar a todos los actores en la recolección y disposición fi nal de residuos sólidos, fomentando la eliminación de criaderos más productivos de mosquitos.
- Capacitación al personal de sectores como: CEAMA, saneamiento y limpia y ayudantes municipales, fortaleciendo las capacidades del personal de salud para estandarizar la información que se imparte hacia la población.
- Dar seguimiento a los convenios de colaboración entre las instituciones (i.e. Servicios de Salud y Municipios).
- Publicar un reglamento para dar seguimiento a la Ley Estatal de Salud, garantizando el cumplimiento de funciones y responsabilidades (financieras y humanas) por parte de los actores: estatales (CEAMA), municipales (Salud Municipal, Saneamiento y limpia, ayudantes municipales) y locales (población de la comunidad).
- Implementar acciones de control vectorial, involucrando a la comunidad, a través de la participación de la población escolar.
- Adaptar las actividades de educación impartidas por los programas de promoción de la salud en materia de dengue, involucrando y estableciendo vínculos intersectoriales con el Sector Educación y CEAMA.
- Fortalecer la comunicación epidemiológica, entomológica y de laboratorio, a nivel estatal, jurisdiccional, municipal y local.
- Fomentar la transdisciplinariedad, conformando grupos de trabajo multidisciplinarios (entomólogos)

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Mapping of health system functions to strengthen priority programs. The case of maternal health in Mexico*

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The surge of financing to scale-up disease control in the context of weak and failing health systems has led to identify health systems strengthening as the top global health priority[1]. This has spurred new thinking on definitions and approaches to health systems analysis and strengthening, seeking to transcend what is perceived as an over-simplistic categorization of horizontal vs. vertical approaches to health promotion, disease prevention and control. Diverse functions have been proposed to target health system strengthening, most recently governance, financing, health service provision, human resources, technology and pharmaceuticals and information[2], with people at the centre of all components as key players and beneficiaries[3]. However, little attention has been given to understand and act upon the perception that people, service providers and health authorities have of the health system in which they work or whose benefits they expect[4].

Evidence-supported policy making is critical to strengthen health systems in a context characterized by rising health needs, ever more complex health systems, new national and global actors and rapid innovation[5]. Health systems analysis and strengthening should therefore pay attention to increasing the capacity of professionals to make decisions at strategic levels in program and disease control management to enable effective integration to the health system. Research-based evidence can be more easily assimilated when it is translated to meet the needs of professionals working in specific health system contexts, and when it is related to the tacit knowledge that enables them to make decisions on a daily basis.

A number of approaches have been proposed to develop a unified health systems framework, relying on diverse analytical, functional or managerial methods[6-10], although their capacity to support disease control capacity strengthening is still to be demonstrated[11]. Systems-thinking frameworks aim to understand complexity and uncertainty in disease control efforts, to anticipate counter-intuitive relationships across functions and to adapt and scale-up complex interventions with system-wide effects such as directly observed therapy-short course (DOTS)[12,13,3]. Systems-thinking seeks to understand how research evidence can be integrated with tacit knowledge through developing frameworks in close relationship to people and health providers in the field[14]. Eliciting actor and context-specific tacit health system knowledge can be useful for evidence-supported policy implementation where both local and global knowledge have to be integrated.

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This paper aims to analyze the characteristics of tacit knowledge on which health personnel in tactical and strategic positions rely to address health objectives. Specifically, the paper seeks to analyze how health system functions are constructed by specific actors and in varying contexts as they face critical decisions to meet problems in disease control through their shared, contextually nuanced tacit knowledge. The paper focuses on maternal health in the most impoverished states of Mexico, which are served by multiple federal public providers and where private care is also available although is mostly inaccessible. State level authorities are responsible since 1995 for the organization of health services for the poor and have mounted together with federal authorities concerted efforts to reduce maternal mortality, in accordance with the MDG 5 commitments. One of the biggest challenges is co-ordination across federal and state authorities and health providers as well as with local authorities and civil society[15,16].

Concept mapping[17] was used to identify health system functions, their degree of classification, the ranking of importance in addressing specific health problems, the ranking of feasibility of improving functional performance and, finally, the structural relationships across functions that code their categorization through underlying contrasts. This last dimension addresses how tacit knowledge builds cognitive maps of functional responsibilities through the systematic opposition and conjunction of categories that help to intuitively identify problems and mount responses.

Research was carried out as part of a research utilization capacity strengthening project for state-level decision makers and program managers in Mexico wishing to focus on disease control for the poor and indigenous populations within their states. Revealing tacit knowledge was a first step in evidence use through identifying their own but varying and often unexamined perceptions of a problem. Maternal health was identified as a common and pressing concern, which could enable them to learn from the project and to extent lessons to other priority programs at a later date.

Methods

Four states in Mexico were purposively selected for the study, having large rural and indigenous populations and with a patent need for health systems strengthening to achieve specific health-related Millennium Development Goals. The states of Mexico, Guerrero, Oaxaca and Veracruz have a combined population of 27.7 million or 26.9% of the national total, of which 13.6% is indigenous population, a figure that for Oaxaca rises to 22.5%. They are ranked at the bottom of 32 Mexican states in the Human Development Index, save for the state of Mexico, which ranks 19. State Ministry of Health decision makers and experts selected maternal mortality as a common concern for capacity strengthening through the use of evidence. Indeed, the four states account for 28% of the 1218 cases reported for the country in 2009 and with maternal mortality rates per 100,000 live births for the same year ranging between 106.0 in Guerrero and 45.6 in the state of México, as against 56 nationally. The states of Mexico and Veracruz also account for the largest number of maternal mortality cases of any state.

A community of practice was identified within each state, defined as a group of individuals engaged in roles and relationships to create maternal health system knowledge, define a field of expression and research and identify tools and objects for manipulation[18]. The community of practice in each state was limited for practical purposes to around twenty-five participants, while national decision makers and researchers were also included. In aggregate, the sample consisted of a balanced mix of 11 state and 11 federal decision makers (ministers of health, medical and finance/administration directors, delegates for other federal medical programs); 19 system-wide support staff in charge of financing, human resources, planning, quality of care and teaching, research and training; 19 reproductive health program managers and local area health managers in the poorest municipalities with high incidence of maternal mortality; 22 hospital staff in charge of maternal health, and 12 researchers from academic institutions.

A series of three workshops was held in each state between March and April 2010 combining capacity strengthening for evidence utilization and concept mapping. Federal decision makers and researchers participated individually at a later stage. The first set of workshops in the series was attended by 21 participants per state, on average (86 total, with a minimum of 8 in Oaxaca). Within each workshop, a variable number of small groups of participants with similar organizational profiles brainstormed to the question "Which are the health system problems that block access to interventions and tools of proven effectiveness to promote maternal health, prevent disease during pregnancy and avoid maternal mortality?" Ideas were first produce in writing and then read aloud by a moderator to reduce duplicates through discussion.

The 460 ideas produced by small groups were later integrated into 99 unique problems through content analysis

and generalization, bringing them to a number that could allow reliable ranking and sorting in the second workshop[17]. Problems were individually printed in 2 × 3 cards with five-point rating scales to measure importance for maternal health ("not important" to "of vital importance") and feasibility of being solved ("impossible"; "difficult"; "possible but no solution known"; "a solution is being formulated"; "a solution is being implemented"). Stacks of cards were distributed to 79 of the original 86 participants and to 15 federal decision makers and researchers. After explaining the purpose of the exercise, each participant proceeded to rank each problem and to sort them into as many piles as they thought important to classify problems for their strategic analysis. The only rules were to produce more than one pile and to allocate each card to only one pile. Participants were asked to name each pile with a descriptive title and to place piles in a named envelope.

Pile data and sorter's role and gender were input to the software Concept Systems Core@ V.4[19]. Problems were mapped through multi-dimensional scaling and factor analysis for groups with at least 11 sorters to ensure reliable maps[17]. Specific problems were mapped in diametrically opposed positions when they were never or seldom grouped together in the card piles across sorters; problems were mapped more tightly together when they were often piled together, and were mapped in the middle when they were as often as not sorted together. Factor analysis grouped the problems into as many function regions as desired at different levels of aggregation.

Data for all participants was first used to generate national concept maps. Actor data was then processed separately to generate and rank six specific maps, one for each actor at the national level.

After analyzing between 8 and 15 levels of aggregation for the national map, a ten-function map was selected as the most significant and parsimonious. Specific maps across actors were generated at the same level for comparative purposes. The Concept Mapping software assigned the most encompassing label to each function, drawing from the individual pile labels and choosing the one with best statistical fit. Function labels for state-level maps were in some cases modified by state communities of practice at a third workshop, seeking the fullest agreement they thought possible with as many of the specific problems contained within each function. Labels for the actor-specific maps were likewise reviewed and modified by the project team.

Maps and functions within them were analyzed for degree of classification, importance, feasibility and structural position. Degree of classification is the number of problems contained within each function. The larger the number of problems, the more richly classified is the function. The Concept Mapping software ranked each of the ten health system functions by importance and feasibility using the problem rankings of individual participants. The software did this by dividing the average grade differences across functions by five, and assigning a value of one to the lowest rank and a value of five to the highest. Spearman correlations were then run by the software across chosen actors for all ten functions.

Structural relationships between functions were compared within and across maps. To this end, the most commonly identified function across all maps was identified and used as reference to align all maps with this function at the top-centre position. Quadrants were then identified and the functions within each quadrant were grouped and placed as bars in a column, with functions at the centre of maps placed at the bottom. By placing columns besides each other, concept maps could then be compared.

The research protocol was reviewed by the Ethics Committee of the National Institute of Public Health. No informed consent was required. All data was maintained confidential and names of subjects were deleted after their profiles were entered in the database.

Results

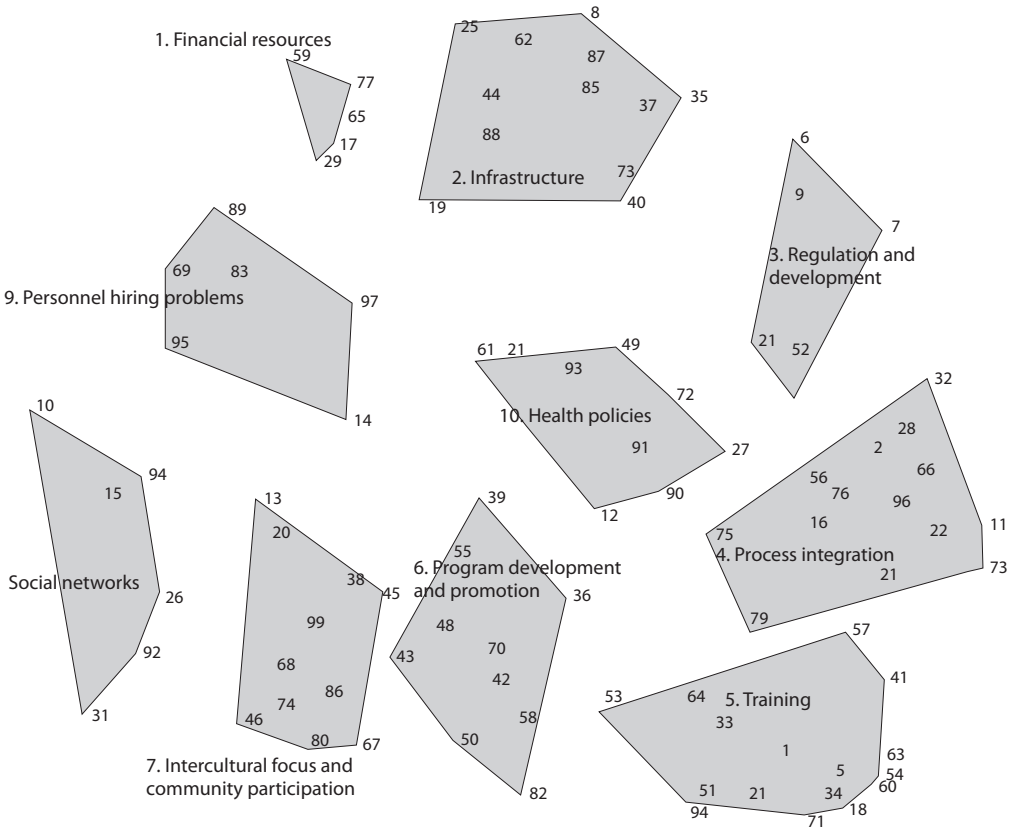
National concept map

Functions F4 Process Integration and F5 Training are those with greatest classification (Figure 1, Table 1).

F2 Infrastructure receives top importance, followed by F1 and F9 Personnel Hiring Problems. F1 and F2 are opposed to functions F5 Training, F6 Program Development and Promotion, F7 Intercultural Focus and Community Participation and F8 Social Networks. The functions opposed to the highly ranked financing and infrastructure all focus on human and social capital and are ranked with the lowest importance, save for F5, which is intermediate. F8 and F9 focusing on processes relating systems to their social context are opposed to F3 Regulation and Development and F4 Process Integration, focusing on internal administrative processes. F10 Health Policies at centre is assigned low importance.

There is a wide spread in the rank correlations of importance assigned by participants to each function, when compared across actor categories (Figure 2). No such spread is apparent with respect to feasibility. The correla-

Figure 1. Concept Map of Health System Functions Relevant for Maternal Health, Ranked for Importance. All Actors*



* The number of layers in each function refers to the importance assigned 1=low; 5= high. Numbered points refer to the 99 individual health system problems brainstormed by participants.

Table 1. Average ratings of Importance (I) and Feasibility (F) of maternal health system problems within each function in the national map, by actor group*

Function	N° of problems in function	All		State-Level Actors								Male		Female		Federal decision-makers		Researchers	
				Decision makers		System-wide support staff		Hospital staff		Reproductive health									
		I	F	I	F	I	F	I	F	I	F	I	F	I	F	I	F	I	F
1. Financial resources	5	4	3	5	2	5	3	3	2	5	2	3	3	4	3	2	5	1	2
2. Infrastructure	12	5	3	5	4	5	4	5	2	5	3	5	3	5	3	4	4	4	4
3. Regulation and development	6	3	2	1	2	4	3	3	1	4	3	2	2	4	2	1	3	2	2
4. Process Integration	15	3	5	4	5	5	4	3	5	4	5	3	5	3	5	3	5	2	5
5. Training	18	3	5	3	5	5	5	2	5	2	5	2	5	3	5	3	5	3	5
6. Program development and promotion	10	1	4	2	3	1	4	1	4	1	5	1	4	1	4	3	4	1	3
7. Intercultural focus and community participation	11	1	4	2	4	2	3	1	3	2	5	1	3	1	4	1	4	1	4
8. Social networks	6	2	1	4	1	4	1	1	1	4	1	3	1	2	1	1	1	3	1
9. Personnel hiring problems	8	4	1	5	1	5	1	3	1	4	2	5	1	4	2	5	1	5	1
10. Health policies	8	1	4	1	5	4	3	1	4	1	5	1	4	1	4	1	3	1	5

* Rank: 1=low; 5= high

Table 2. Concept Map of Health System Functions Relevant for Maternal Health, Ranked for Importance. All Actors*

Actor		State decision-makers	System wide support staff	Hospital staff	Reproductive ductive local healt programs	Federal decision makers	Researchers	Male	Female
State decision-makers	I		0.53	0.63	0.79	0.57	0.62		
	F		0.76	0.85	0.93	0.65	0.84		
System wide support staff	I	0.53		0.76	0.64	0.38	0.63		
	F	0.76		0.72	0.81	0.83	0.82		
Hospital Staff	I	0.63	0.76		0.72	0.68	0.67		
	F	0.85	0.72		0.91	0.7	0.71		
Reproductive health programs	I	0.79	0.64	0.72		0.26	0.57		
	F	0.93	0.81	0.91		0.69	0.79		
Federal decision makers	I	0.57	0.38	0.68	0.26		0.68		
	F	0.65	0.83	0.7	0.69		0.68		
Researcher	I	0.62	0.63	0.67	0.57	0.68			
	F	0.84	0.82	0.71	0.79	0.68			
Male	I								0.8
	F								0.94
Female	I							0.8	
	F							0.94	

tion of importance across actors is highest when comparing male with female participants (r = 0.80). There is a negative relationship -although weak- between the rankings of importance and feasibility across functions (r = -0.14). The correlation of the perception of function importance by federal decision makers is highest -although still moderate- when compared to hospital staff and researchers (r = 0.68 in both cases) and lowest against reproductive health programs (r = 0.26). This latter is of interest given that federal decision makers seek a close relationship with reproductive health and local area program officers on the ground. The correlations of state decision makers against their federal counterparts and against hospital staff are moderate (r = 0.57 and 0.62, respectively), while against reproductive health program managers is moderately high (r = 0.79). Interestingly, it is lowest with system-wide support staff (r = 0.53), suggesting that the mind-set of state decision makers is closer to that of clinicians and public health workers than to administrators. It is also interesting to note that reproductive health program officers have a closer agreement with state decision makers than with federal decision makers. Hospital staff and reproductive health program managers correlate highly (r = 0.72), as do personnel across gender (r = 0.80).

State decision makers

Analysing now the specific maps for each of the actor categories (Figure 3), functions F1 Infrastructure and Supplies and F3 Budget and Financial Resources have the highest importance and also high classification. F7 Health Services Provision has the highest classification although it is assigned a moderate importance. F1, F2 Communications on Mass Media and F3 -of a material and mass-marketing nature- are opposed to F5 Training and F6 Insufficient Training, focusing clearly and emphatically on human resource processes. F4 Incentives is opposed to F7 and to F8 Adolescents, without a clear meaning. At the centre of the map are placed F9 Traditional Medicine and F10 Alternative Personnel, this last with lowest importance.

Most functions are ranked 4 or 5 in importance. F4 Infrastructure and F5 Health Services Accessibility are opposed to F4 Training and F5 Medical Education, suggesting an opposition between material and human resources. F3 Human Resources is contrasted with F7 Information Analysis and F8 Health Policies and to an extent with neighbouring F6 Maternal Health Planning, all of which focus on health policy and planning and which receive

Table 3. Health System Functions Specific to Each State Actor Category, with Number of Problems (No.) and Importance (I)*

	State decision makers			System-wide support			Hospital staff			Reproductive health			Federal decision-makers			Researchers		
	Function	No.	I	Function	No.	I	Function	No.	I	Function	No.	I	Function	No.	I	Function	No.	I
1	Infrastructure and supplies	10	5	Infrastructure	14	4	Hospital infrastructure	6	4	Equipment	14	5	Infrastructure and equipment	6	4	Infrastructure	12	4
2	Mass media	11	3	Health services accessibility	10	5	Material resources	12	5	Regulation	8	5	Infrastructure	10	5	Equipment	12	5
3	Budget and financing	13	5	Human resources	11	5	Technology	8	4	Hospitals	6	3	Human resources	8	3	Communications and transport	3	2
4	Incentives	10	3	Training	12	5	Federal supervision	5	1	Processes	13	5	Training	12	4	Gender equity	9	1
5	Training	9	3	Medical education	6	5	Hospital policies	24	2	Train in 1st & 2nd level care	7	3	Health policy	16	2	Population training	9	3
6	Insufficient training	8	3	Maternal health planning	12	3	Training to personnel and patients	9	3	University Concerns	7	3	Sector & inter-sector coordination	13	3	Human resources	16	3
7	Health services provision	15	3	Information analysis	14	4	Academic training	11	1	Gender inequity	12	3	Community-health program relations	13	4	Information and research	9	2
8	Adolescents	10	3	Health policies	11	3	Patient responsibility (blame)	8	3	Inter-institutional management deficiencies	12	3	Health promotion	10	3	Regulation and health services	6	4
9	Traditional medicine	4	3	Maternal care strategies	5	4	Human resources management	6	2	Medical Educ. and training	11	1	Self-care and quality	6	4	Supervision and monitoring	14	3
10	Alternative personnel	9	1	Health authority co-responsibility	4	1	Access and communication	9	1	Health policies	9	2	Infrastructure policy	5	2	Integration of public-private & inter-inst. criteria	7	1

* Colours indicate the position of each function in the actor's map quadrants after placing "Infrastructure" in all maps at the top: Top (yellow); Right (blue;) Bottom (pink); Left (green), and Centre (grey). All maps were rotated to have the infrastructure function at the top. I= Importance is coded 1 =Low; 5= High

among the lowest importance except for F10 Health Authority Co-Responsibility in the middle, with the lowest importance.

Hospital staff

Function F2 Material Resources is the most highly ranked for importance. Neighbouring functions F1 Hospital Infrastructure and F3 Technology follow in importance. This set of functions -all of a clear material nature- are opposed to F6 Training to Personnel and Patients and F7 Academic Training, both of a human resource nature and receiving low to very low importance, respectively. F4 Federal Supervision and F5 Hospital Policies receive also very low importance, and are opposed to F8 Patient Responsibility (Blame) and F9 Human Resource Management, which receive moderate to low importance, respectively. However, F5 is the most highly classified function, with a total of 24 problems and the highest for any function across maps. F10 Access and Communication receives also least importance and is placed in an ambiguous position.

Reproductive health program managers

Function F1 Equipment is ranked of top importance and is highly classified. Also of top importance are neighbouring F2 Regulation and F4 Processes. All other functions are ranked 3 or below, suggesting these actors have a clear set of priorities. At the centre is F9 Medical Education and Training with the lowest importance and F10 Health Policies, ranked of low importance. F1 and F2, with a mix of infrastructure and regulation, are opposed to F5 and F6 focusing on training or in technical support.

Federal decision makers

Function F2 Infrastructure is given top importance. F7 Community-Health Program Relations is highly classified and assigned a high importance. F10 Infrastructure Policy is placed in the middle, with only a few points and given lowest importance. Infrastructure functions F1 and F2 are placed opposite F5 Health Policy, the most classified function although with low importance. This opposition suggests a contrast between the technical authority held by federal decision-makers and the more unwieldy infrastructure issues that depend on financial and human resources not under their direct control. Human resource functions F3 Human Resources and F4 are placed opposite F6-F8, suggesting a contrast between the centralized control over human resources and functions that are more dependent on state and community level processes.

Researchers

The function with highest importance is F2 Equipment, being also highly classified. F1 Infrastructure follows in importance. F6 Human Resources is the most highly classified function. The function in the middle F10 Integration of Public-Private and Inter-Institutional Criteria receives the lowest importance, together with F4 Gender Equity. As with other maps, infrastructure and equipment functions are opposed to F5 Training, while social functions F3 and F4 are opposed to health sector process functions F7 Information and Research, F8 Regulation and Health Services and F9 Supervision and Monitoring.

Discussion

The moderate to high correlations in the ranking of importance in the national map across hospital and program officers, across state decision-makers and reproductive health program officers and across the gender of participants points to a tightly knit, gender-neutral community of practice with respect to maternal health. The lower agreement between federal and state decision makers, between federal decision makers and reproductive health/local health area program officers and between state decision makers and system-wide support officers are of interest and possible concern. The latter situation may respond to the fact that decision makers at the state level are almost always clinicians with little administrative experience.

Health system maps are configured with a fairly constant set of oppositions. Health sector material and structural features -financing and infrastructure- are consistently placed opposite health sector processes and particularly opposite to training. On the other axis, health sector functions of regulation, processes and training are opposed to functions at the margins of the formal health system such as personnel hiring, social networks and community participation. The opposition between infrastructure and training is present across all maps, except for federal decision-makers. The more generic human resources function is mentioned across maps next to diverse functions, including three mentions at the centre of maps, where ambiguous functions are represented.

The mapping of functions along the structures-processes axis suggests that communities of practice perceive certain functions as unwieldy and dominated by federal

and state actors outside of their direct control -particularly financing and infrastructure, as opposed to processes that can be managed, particularly the training of human resources. Comprehensive human resource management is more ambiguously conceived as both a structure and a process closely associated to other functions. Such coding reflects a fragmented and still highly centralized system, where federal decision-makers, trade unions and state politicians wield most power, particularly over human resources and infrastructure.

Functions identified at the centre of all maps, while highly ambiguous for the communities of practice, have a strategic importance as they mediate across all peripheral and otherwise less connected functions. This role is thus apparent for alternative health care models (state decision makers), authority co-responsibility (system support staff), alternative personnel (state decision makers) and self-care and quality (federal policy makers).

The health policy function is mapped at the centre and is ranked with low importance for most actors, with the exception of federal decision makers, for whom health policy is highly focused and highly classified. This finding strongly suggest that maternal health policy is dominated by the federal government and that state authorities have little capacity to reformulate it or to enact state policies. This may be a consequence of a still unfinished and highly ambiguous decentralization process where state ministers are political appointees of state governors, but where most policy and financing is federal, particularly in the poorest states of Mexico[15].

Concept mapping proved to be a useful tool to order and understand the tacit knowledge that diverse health sector actors draw-upon when collaborating for a common yet highly complex goal such as the prevention of maternal mortality. The process enabled participants to identify critical functions and to identify their importance, feasibility and relationship to the health system and to its context. By representing results in a graphic way, stakeholders were able to grasp complex relationships in a more intuitive way and to make them available for analysis, as shown. The ranking of importance and feasibility led to discriminate across functions and to support priority setting for the identification of solutions. The interpretation of concept maps thus promises to enable the assessment of areas of common interest while identifying areas of opportunity and also weaknesses in the relationship across actors.

Conclusions

This research demonstrated the usefulness of concept mapping to reveal the characteristics of tacit knowledge of health system functions that a wide range of actors consider critical to address maternal health. The most relevant and consistent maternal health system functions in Mexican states with high incidence of maternal mortality are infrastructure and training. They are perceived with high consensus and specificity across actors and states, are highly valued and show a consistent mutual opposition that may account for their reciprocal definition and consolidation in tacit knowledge. These two areas of tacit knowledge correspond with the concerns that federal health decision-makers and maternal health experts have stressed in the last decade as being of uttermost concern in Mexico, especially in the poorest states of the country, such as Guerrero, Oaxaca and Veracruz. The federal Ministry of Health has repeatedly remarked on the importance to improve medical skills in attending obstetric emergencies[20,21]. Efforts to expand hospital infrastructure and train medical personnel in emergency obstetric care at the primary and secondary level are among the most important strategies implemented in these states in the last few years[16]. Mapping of the infrastructure and training functions across actors thus attests to the high level of consensus achieved through policy implementation by federal authorities towards.

Health service provision also turned out to be highly relevant in concept maps, although somewhat less focused and showing adaptation to context and actor positions. The reorganization of health services has also been emphasized by the federal maternal health program on the basis of international evidence, which at least since 2003 proposes regionally based, effective functional health care networks[22,23].

Comprehensive human resource planning and social and cultural issues have lower consensus and classification and, above all, appear dispersed in different positions across maps. This suggests not so much an adaptive process but rather a lack of capacity to address such structural and difficult to influence features of the health system. It is worth emphasizing that social and cultural issues are notwithstanding clearly perceived by actors as intrinsic to the maternal health system, while such features are frequently absent in normative international health system frameworks[2]. Finally, health policy -while relevant- shows on the part of state communities of practice a consistent ambiguity and lack of capacity to be addressed. This is a

weakness that could affect other large developing countries where decentralization is critical to face maternal mortality. If it is not addressed, it is likely that investments in infrastructure and training may not be efficient, while efforts to establish health service networks may not be sustainable.

The elicitation of the tacit knowledge that actors have of health systems can help to design and implement health system strengthening and scaling-up strategies that can be more easily adapted to varying situations. Mapping of tacit knowledge can help evaluate how actors´ perceptions change after strengthening efforts, leading to the identification of key functions with greater consensus and more focused relations across system levels.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

MAGB designed the overall project and participated in instrument development, workshops and interpretation. MR, VB and PS developed the research instruments, coordinated workshops and participated in the interpretation of data.

All authors have read and approved this manuscript.

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