INTRODUCTION

The United Mexican States is a representative and democratic republic, consisting of 31 states, the federal district, and 2,438 municipalities, which are united in a federation, are of equal rank, and abide by principles of autonomy and association. Federal and state elections take place every six years and those for municipal governments, every three years.

The Mexican economy was affected by two complex circumstances in 2009: the international financial crisis, which influenced macroeconomic outcomes throughout the year, and the impact of the A(H1N1) influenza pandemic on economic activity during the second quarter of the year. Economic activity in the country was affected by a major decrease in external demand, deterioration in the terms of trade, and a marked constriction in international financial markets, which led to a 6.5%
annual contraction in the gross domestic product (GDP) in 2009, comparable to that registered during the 1995 crisis (6.2%) (1, 2). With regard to the A(H1N1) influenza pandemic, the economic impact analysis—from the initial outbreak in the second quarter of 2009 to the second quarter of 2010—showed that health and education expenditures climbed by nearly 10,455 million pesos, 91.6% of which corresponded to the health sector. The epidemic also triggered a 0.15 percentage point reduction in the GDP growth rate, which had the strongest impact on trade, transportation, postal and storage services, and hotel and food and beverage services (2).

In terms of insecurity, from 2009 to 2010 the number of common crimes committed in the country nearly doubled, climbing from 11,864,765 to 22,714,927. Based on this increase, the financial costs of insecurity and crime were estimated at over 200,000 million pesos (3).

According to the 2010 census, Mexico has a total population of 112,336,538 (57,481,307 females and 54,855,231 males) and continues to be a country of young people: half of its residents are 26 years old or younger, and 29% are 14 years old or younger (Figure 1). From 1990 to 2010, the population as a whole grew at an annual average rate of 1.6%, while the group aged 60 and over rose 3.8%. During this 20-year period, the number of older adults went from 5 million to 10.5 million and increased proportionally from 6.2% to 9.4% of the population (4). Women of childbearing age (15 to 49 years) had an average of 2.4 children, or one child less than 20 years ago (3.4 children). With this reduction, the country is approaching the number of live births necessary to replace the present population (4). Children (0–14 years) account for over 32% of the population in states such as Chiapas and Guerrero, in contrast to just 21.8% in the Federal District. According to the 2010 census, only 23.5% of the total national population lives in places with fewer than 2,500 inhabitants, while nearly half the population (47.6%) resides in settlements of 100,000 people or more.

Between 2005 and 2012, 1% of Mexicans emigrated. Of these, 89.5% went to the United States of America, 2.4% to Canada, 1% to Spain, and the remaining 7.1% to other destinations (4).

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1 The 2009 exchange rate was 13.83 Mexican pesos to the constant U.S. dollar.
Mexico’s crude migration rates—based on a comparison of data from 2006 and 2010—indicate that emigration declined from 78.5 to 36.2 per 10,000 population and international immigration from 53.8 to 23.7 per 10,000 population, resulting in a shift in the migration balance from –24.7 to –12.5 per 10,000 population. The average age of emigrants was 30.8 years (4). Also according to data from the 2010 census, the states with the highest percentage of people born in a different state or country are Quintana Roo, with 54% of its residents; Baja California, with 45.1%; Baja California Sur, with 39.7%; and the state of Mexico, with 37%. At the other end of the spectrum, Chiapas has the smallest percentage of non-native population (3.6%), followed by Guerrero and Oaxaca.

Nationwide, the number of people born outside of Mexico is 961,121, or 0.85% of the country’s residents; this population has nearly tripled in two decades since 1990. Also based on preliminary census data, the states reporting the largest number of migrants to other countries are Guanajuato, Jalisco, Michoacán, and Mexico, which together account for 33% of the country’s international emigrants. The municipalities that send the most migrants abroad are León, Puebla, Juárez, Zapopan, and Morelia.

According to the National Household Income and Expenditure Survey for 2008 (5), 50.6 million Mexicans were living in poverty that year, meaning that their income could not cover their basic health, education, food, housing, clothing, and public transportation needs, even if they used all of their economic resources for this purpose. Moreover, 19.5 million people were living with food poverty; in other words, their income was insufficient to obtain a basic food basket even if they put all of it toward that purpose (5). Between 2006 and 2008, the incidence of poverty—the percentage of poor people—rose from 42.6% to 47.4%, and the incidence of food poverty, from 13.8% to 18.2%. In absolute terms this signifies an increase of 5.9 and 5.1 million people, respectively, in those categories (an increase from 44.7 to 50.6 million in the first and from 14.4 to 19.5 million people in the second) (6). According to official figures, the country’s economically active population (EAP) is an estimated 57.5% of the total population, a growing segment of the EAP is working in the informal economy (28.5%), and the unemployment rate is an estimated 5.2% (Box 1) (7).

**HEALTH DETERMINANTS AND INEQUALITIES**

One way of approaching the problem of health inequality is by reviewing the indicators from Mexico’s 100 most disadvantaged municipalities. Predominantly indigenous and home to the million poorest Mexicans, they are mainly concentrated in Chiapas (30%), Oaxaca (20%), Guerrero (17%), and Veracruz (15%). The risk of a child dying before 1 year of age is 1.7 times higher in these municipalities relative to the national average for this age group. Life expectancy is only 51 years for women and 49 years for men (compared to the national averages of 77.4 and 72.6 years, respectively) (8).

The figures also reflect significant levels of gender-based and ethnic inequality: 2.5 million more women than men are living in poverty; 8 million more employed women than men lack health insurance and the right to a pension; and 7.6% of women over 15 years of age are illiterate, compared to 4.8% of men. Similarly, 32.5% of indigenous people over age 15 are illiterate and, worse still, the illiteracy rate among indigenous women sometimes doubles or triples that of indigenous men (7, 9).

Data from the 2010 census also show that 6.9% of the population aged 15 years and older—5.6% of men and 8.1% of women—cannot read or write. Estimates based on the same source indicate that 41.8% of the population aged 15 and older did not complete or pass some grade of primary or secondary school and, of this population, one out of every six (17.7%) never even passed first grade. As a result, the average level of schooling of the population aged 15 years and older is only 8.5 grades, meaning that very few reach even the second year of secondary school.

The number of households with indoor connections to piped drinking water rose 13.6% and the number of households with dirt floors declined
33.6%. In 2008, the national percentage of households with connections to piped drinking water was 69.7%, which is 2.7% higher than the figure for households with members under 18 years of age. While 71.3% of non-indigenous children live in homes with piped water connections, just 31.4% of indigenous children live in homes with that service. Similarly, 85.9% of non-indigenous households with members under the age of 18 have a refrigerator, compared to just 55.5% of indigenous households \((7, 9)\). Finally, just 23.3% of indigenous children live in homes where the head of household has a basic education or higher, compared to 53.5% of non-indigenous households.

According to data from the National Survey on Occupation and Employment (ENOE), as of the second quarter of 2010, the labor force participation rate was 59.2% for people aged 14 years and older, 94.7% of whom were working and 5.3% of whom were looking for a job. The unemployment rate is higher in the population with more schooling: it is 2.2% among those with no schooling and rises to 6.2% and 5.9% for those with a high school or postsecondary education, respectively \((9)\).

### THE ENVIRONMENT AND HUMAN SECURITY

#### Access to Clean Water and Sanitation

With regard to water uses, the volume of concessions granted as of December 2009 was distributed as follows: agricultural use 76.7%, public supply 14.1%, industrial use 4.1%, and electricity—excluding hydroelectric—5.1%. The average natural availability per capita that same year was 4,263 m\(^3\)/year. Sixty-three percent of water consumed in the country came from surface sources (rivers, streams, and lakes) and 37% from underground sources (aquifers). Drinking water coverage was 90.7% (94.3% in urban areas and 78.6% in rural) and sewer system coverage in 2009 was 86.8% (93.9% in urban areas and 63.2% in rural) \((10)\).

#### Solid Waste

According to data from the National Plan for Urban Solid Waste Prevention and Management for 2009–2012, an estimated volume of 34.6 million
tons of urban solid waste is generated annually, 53% of which is organic waste, 28% is potentially recyclable waste, and 19% is non-reusable. A total of 87% of the solid waste generated is collected; 64% of it is sent to 88 sanitary landfills, 21% to controlled sites, and the remaining 15% is deposited in open dumps or unmonitored sites.

**AIR POLLUTION**

In 2008, mobile sources accounted for 16.1% of emissions of particles smaller than 10 micrometers (PM10) in the Metropolitan Area of Mexico City, as well as 51.8% of particles smaller than 2.5 micrometers (PM2.5), 49.3% of sulfur dioxide, 99% of carbon monoxide, 82.4% of nitrous oxides, 31.3% of volatile organic compounds, 20.6% of toxic contaminants, and 23.8% of ammonia. Private vehicles, one of the main sources of pollutants, generate 41% of CO, 32% of NOx, and 25% of SO2. Diesel vehicles are another major mobile source of emissions, especially heavy cargo vehicles and buses, which together generate 36% of PM2.5 and 25% of NOx. (11).

**ROAD SAFETY**

Official 2011 figures from the National Observatory of Injuries of the Council for the Prevention of Accidents (CONAPRA) indicate that in 2010, 16,559 people died as a result of road traffic accidents. The number of vehicles in circulation has increased exponentially, from 17,300,530 in 2001 to 32,338,820 in 2010. The Mexican roads and transportation system is based on the private automobile, a very vulnerable mode of transportation whose costs to society include vehicular collisions and congestion as well as high levels of pollutant gas emissions. With the aim of reversing the current trend and reducing mortality from road traffic injuries by 50% in the next 10 years, in 2011 the country signed resolution A/RES/64/255 of the United Nations General Assembly called the “Decade of Action for Road Safety 2011–2020” and issued a decree mandating a National Strategy for the Decade of Action.

**VIOLENCE**

Every day, 50 people in Mexico die from violence, 1,250 receive medical treatment as a result of violence, and 100 are left with some type of disability due to injuries caused by some form of violence. Murders related to drug trafficking have risen dramatically: 8,901 homicides were registered in the period from 2000 to 2006, compared to 34,550 between 2007 and 2010. Eighty-four percent of all murders occur in four states: Chihuahua, Sinaloa, Guerrero, and Baja California. In 2010, 70% of violent acts were concentrated in 80 municipalities and 32% of homicides occurred in just five cities: Ciudad Juárez (2,738), Culiacán (587), Tijuana (472), Chihuahua (670), and Acapulco (370). In 2009, the financial cost of insecurity in Mexico was calculated at 8.9% of the GDP (3).

**CLIMATE CHANGE**

In 2006, Mexico’s emissions in units of carbon dioxide equivalent (CO2 eq) were 709,005 Gg. The contribution by category in terms of CO2 eq was as follows: waste, 14.1% (99,627.5 Gg); land use, land-use change, and forestry, 9.9% (70,202.8 Gg); industry, 9% (63,526 Gg); agriculture, 6.4% (45,552.1 Gg); and energy, 60.7% (430,097 Gg). CO2 emissions per capita in 2006 were 6.2 metric tons (t), although when the category of “land use, land-use change, and forestry” was omitted, the per capita figure was 5.9 t. Deforestation of forests and jungles exceeded 155,152 hectares annually between 2002 and 2007 and a total of 219,546 hectares of primary forests were lost during that period (12).

**FOOD AND NUTRITIONAL SECURITY**

The 2006 National Health and Nutrition Survey found that emaciation or acute malnutrition had declined 73% in the last 20 years, reaching a low of 1.6% (13). On the other hand, obesity and overweight have become serious problems in Mexico over the past few decades (see Box 2).
Health Conditions and Trends

Health Problems of Specific Population Groups

Maternal and Reproductive Health

According to the available data for 2008, in the 125 Mexican municipalities with the lowest rankings on the Human Development Index (HDI), the maternal mortality ratio (MMR) was 182.6 deaths per 100,000 estimated live births, a 12.3% increase over the figure used as the baseline (2006). This represented a turning point for this indicator, which fluctuated between 139 and 183 deaths per 100,000 estimated live births thereafter (14). It is important to point out that these deaths were registered in just 40 (32%) of the 125 municipalities. Given the need for reliable figures on maternal mortality, activities such as the deliberate search and reclassification of suspected and confirmed maternal deaths nationwide have been underway since 2002. Since this effort began, between 10% and 20% of maternal deaths that were not classified as such have been re-examined—and reclassified—each year (14).

Infants and Children (under 5 years old)

The infant mortality rate was 15.7 deaths per 1,000 live births in 2007—reflecting a 3.1% decrease relative to the 2006 rate—and 14.2 in 2010. Infant mortality for the 100 municipalities with the lowest HDI ranking was 34.6 deaths per 1,000 estimated live births, meaning that the risk of newborns dying in these municipalities is 2.2 times the national average. The Health Sector Program (PROSESA) set a 2012 target for reducing infant mortality by 40% in the 100 municipalities with the lowest HDI ranking. A 0.5% reduction was achieved from 2006 to 2007, and the challenge for the program for 2007–2012 was to ensure that infant mortality did not surpass 20.4 deaths per 1,000 live births. A 43% reduction was registered during 2007–2010 and should this trend continue, it will be possible to meet the goal established for 2012.

There are disparities in infant mortality rates between states: in 2008, outliers were found in Guerrero (21.5 per 1,000 live births) and in Nuevo León (10.6 per 1,000 live births, which is even below the national level). Seventy percent of infant deaths were caused by perinatal disorders or congenital malformations, while infectious causes such as diarrheal diseases or respiratory infections had declined. In 2009, 17.3 deaths per 100,000 children aged 1 to 4 were reported, compared to 47.2 deaths in 1990, representing a significant decline between those two years. In 2009, the leading cause of death in this age group was acute lower respiratory tract infections (22.7 deaths per 100,000 children in this age group), followed by congenital heart malformations (5.4 deaths per 100,000) and road traffic injuries (5.3 deaths per 100,000). In 2009, the state of Chiapas registered the highest mortality from acute respiratory infections, with a rate of 48.8 deaths per 100,000 children under 5, while Nuevo León had the lowest rate with 7.2 deaths. This significant disparity indicates that the risk of dying from a respiratory infection among children under 5 in the state of Chiapas is 6.7 times greater than the risk in Nuevo León (15).

Box 2. Obesity and overweight: a daunting public health challenge in Mexico.

The number of obese and overweight persons has tripled in Mexico over the past 30 years. Currently, more than 71% of adults are overweight: 39.5% are overweight (BMI ≥ 25 kg/m² but < 30) and 31.7% are obese (BMI ≥ 30 kg/m²). Obesity, which is considered virtually an epidemic in the country, is not only a risk factor for the development of ailments such as diabetes and vascular diseases, it also reduces life expectancy and affects quality of life. It is understood, then, that Mexico’s primary public health concern is controlling chronic, non-communicable diseases, particularly diabetes, which affects 14 out of every 100 adults, and excess weight and obesity, which affects 7 out of every 100 Mexicans over 25 years of age.
Children (5–9 years old)

According to estimates from the National Population Council of Mexico, in 2009 the population of children aged 5 to 9 was 9,838,470, accounting for 9% of the total population. In 2010, the main health problems among school-age children were respiratory infections (19,729 cases), infectious and parasitic diseases (9,348), injuries (8,941), and birth defects (8,821). Accidents were among the 10 leading causes of health ailments (5,583 cases), especially those resulting from the ingestion of toxic substances in the home.

Adolescents

Mexico’s adolescent population exceeded 21 million in 2009 and accounted for over 20% of the total population. States with the highest percentage of population under age 18 relative to the total are Chiapas (40.5%), Guerrero (39.7%), Aguascalientes (37.7%), and Oaxaca (37.6%). Adolescents suffer the largest number of deaths due to road traffic injuries: in 2006 they accounted for 32.7% of all deaths from this cause; that figure rose to 34.1% in 2009 (1).

Adults and the Elderly

There were 48.2 million adults (ages 25 to 64) in 2008 and over 5 million people aged 65 and older. In contrast to other age groups, the population aged 65 years and older is growing at an annual rate of 2% and, surprisingly, the group over age 85, at a rate of 3% to 5%. According to the Directorate General of Health Information under the Secretariat of Health, an estimated 84% of deaths in the country are due to noncommunicable diseases and injuries, and 53% of them occur in people ages 65 or older (16).

Ethnic or Racial Groups

According to 2010 census data, 6.9 million people speak an indigenous language and over half of them are located in four states: Chiapas (18.3%), Oaxaca (17.3%), Veracruz (9.3%), and Puebla (9%). The census captures the name of the indigenous language spoken as a marker of specific cultural identity; the most prevalent languages are Náhuatl (23%), Maya (11.5%), Tzeltal (7%), Mixteco (6.9%), and Tzotzil (6.5%). The census also found that 93.8% of those who speak an indigenous language consider themselves indigenous and 9.3% of those who do not speak one consider themselves indigenous. Indigenous adolescents and adults are at higher risk of disease and death than the general population. The leading cause of death is diabetes for women, and cirrhosis and other chronic liver diseases for men (17).

Other Groups

Persons with Disabilities

Based on the expanded questionnaire from the 2010 National Census, 5,739,270 Mexicans—with a higher proportion of women—were identified as having some physical or mental difficulty in carrying out everyday activities. The highest percentage (40.7%) of individuals with some disability fall into the 60- to 84-year age group, followed by adults aged 30 to 59 years. Two out of every 10 people with a disability are under the age of 30, which is considered relevant since people in this age group require appropriate conditions and facilities for their development. The potential for experiencing some type of physical or mental limitation increases with age: males between the ages of 15 and 29 years with some disability account for 2.2% of the entire male population, while those between the ages of 60 and 84 years account for 23%. Similar to the case of men, 25% of all women between the ages of 60 and 84 years experience some limitation in carrying out everyday activities. Among the Mexican population that reported having at least one disability, the leading cause was disease (39.4%), followed by old age (17).

Mortality

According to the “Health Situation in the Americas: Basic Indicators” (2010), underreporting of mortality in Mexico was estimated at 1.5% during 2006–2008, and ill-defined and unknown causes accounted
for 1.9% of reported deaths in 2008. During 2005–2009, cause of death patterns reflected a preponderance of chronic degenerative diseases (Tables 1 and 2) (16).

**Morbidity**

**Communicable Diseases**

**Vector-borne Diseases**

Confirmed dengue cases increased by 43% from 2006 to 2007. The following year, new guidelines

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Rank</td>
<td>Cause</td>
<td>No. of deaths (2005)</td>
</tr>
<tr>
<td>1</td>
<td>Diabetes mellitus</td>
<td>67,159</td>
</tr>
<tr>
<td>2</td>
<td>Ischemic heart diseases</td>
<td>53,416</td>
</tr>
<tr>
<td>3</td>
<td>Cirrhosis and other chronic diseases of the liver</td>
<td>27,588</td>
</tr>
<tr>
<td>4</td>
<td>Cerebrovascular diseases</td>
<td>27,398</td>
</tr>
<tr>
<td>5</td>
<td>Chronic obstructive pulmonary disease</td>
<td>20,270</td>
</tr>
<tr>
<td>6</td>
<td>Acute lower respiratory infections</td>
<td>14,990</td>
</tr>
<tr>
<td>7</td>
<td>Hypertensive diseases</td>
<td>12,888</td>
</tr>
<tr>
<td>8</td>
<td>Nephritis and nephrosis</td>
<td>11,405</td>
</tr>
<tr>
<td>9</td>
<td>Land transport accidents</td>
<td>10,817</td>
</tr>
<tr>
<td>10</td>
<td>Assaults (homicides)</td>
<td>9,921</td>
</tr>
<tr>
<td>Total of all deaths</td>
<td>495,240</td>
<td></td>
</tr>
</tbody>
</table>

| TABLE 1. Leading causes of mortality in Mexico, 2005–2009. (Continued) |
| --- | --- | --- |
| Rank | Cause | No. of deaths (2007) |
| 1 | Diabetes mellitus | 70,517 |
| 2 | Ischemic heart diseases | 56,027 |
| 3 | Cerebrovascular diseases | 29,277 |
| 4 | Cirrhosis and other chronic diseases of the liver | 27,850 |
| 5 | Chronic obstructive pulmonary disease | 19,727 |
| 6 | Hypertensive diseases | 14,599 |
| 7 | Acute lower respiratory infections | 14,578 |
| 8 | Nephritis and nephrosis | 11,735 |
| 9 | Land transport accidents | 10,530 |
| 10 | Assaults (homicides) | 8,868 |
| Total of all deaths | 514,420 |

| TABLE 1. Leading causes of mortality in Mexico, 2005–2009. (Continued) |
| --- | --- | --- |
| Rank | Cause | No. of deaths (2008) |
| 1 | Diabetes mellitus | 75,637 |
| 2 | Ischemic heart diseases | 59,801 |
| 3 | Cerebrovascular diseases | 30,246 |
| 4 | Cirrhosis and other chronic diseases of the liver | 28,442 |
| 5 | Chronic obstructive pulmonary disease | 20,584 |
| 6 | Hypertensive disease | 15,709 |
| 7 | Acute lower respiratory infections | 15,114 |
| 8 | Assaults (homicides) | 14,007 |
| 9 | Nephritis and nephrosis | 12,601 |
| 10 | Land transport accidents | 12,128 |
| Total of all deaths | 539,530 |

| TABLE 1. Leading causes of mortality in Mexico, 2005–2009. (Continued) |
| --- | --- | --- |
| Rank | Cause | No. of deaths (2009) |
| 1 | Diabetes mellitus | 77,699 |
| 2 | Ischemic heart diseases | 63,332 |
| 3 | Cerebrovascular diseases | 30,943 |
| 4 | Cirrhosis and other chronic diseases of the liver | 28,309 |
| 5 | Chronic obstructive pulmonary disease | 21,716 |
| 6 | Assault (homicide) | 19,804 |
| 7 | Acute lower respiratory infections | 18,654 |
| 8 | Hypertensive diseases | 18,167 |
| 9 | Nephritis and nephrosis | 13,120 |
| 10 | Land transport accidents | 12,673 |
| Total of all deaths | 564,673 |

Source: General Directorate of Information of the Secretariat of Health of Mexico.
for the prevention and control of this disease were implemented nationally based on targeting preemptive actions toward clusters of probable cases. Because of these measures, following an upsurge in 2009, dengue cases began to fall and in 2010 had returned to 2006 levels. According to official figures, there was a 48% absolute reduction in cases between 2009 and 2010 and the case-fatality rate for dengue hemorrhagic fever remained below 1% (18).

With regard to malaria, the identification of “malaria houses” (1998–2000), targeted medical treatment of cases, and the elimination of vector breeding sites with community participation (2000–2010) contributed to a 52.1% reduction in the number of malaria cases caused by *Plasmodium vivax*. These measures were also instrumental in interrupting local case transmission, eliminating the disease as a cause of death in Mexico, reducing active transmission by 37% between 2006 and 2010, and maintaining all tourism resorts and national development zones free of transmission for 15 years. Transmission control is verified by taking and reading an average of 1.3 million blood samples annually for the detection of local and imported cases. As of the end of 2010, 21 states were in a position to be certified as malaria-free areas. The only areas of Mexico with residual malaria transmission were the northwest and south-southeast, where the states of Chiapas and Oaxaca account for 90% of all cases in the country (18).

The incidence of onchocerciasis—the second disease in the process of being eliminated in Mexico—declined from 92 cases in 2006 to 8 cases in 2010 (91.3%). Transmission has been declared eliminated and ivermectin treatment in two of the three endemic foci in the country has been suspended. The remaining focus in the state of Chiapas is expected to enter the treatment suspension in 2012 with a three-year epidemiological surveillance phase. The capacity for detection and treatment of both Chagas’ disease and leishmaniasis has been strengthened. Capacity for treating Chagas’ cases doubled between 2006 and 2008, and the number of cases treated annually rose to 300 in 2009 and to 700 in 2010, accompanied by growing access to treatment for indeterminate cases in people under 25 years of age. Although localized cutaneous leishmaniasis continues to be the most frequent clinical form of this disease, outbreaks of the visceral form in Chiapas are a focus of early warning for stepping up efforts to marshal the resources necessary for its prevention and control. In 2010, a donation of meglumine antimoniate made it possible to treat 93% of the confirmed cases (18).

**Vaccine-preventable Diseases**

Mexico’s vaccination schedule is among the most complete in the Region and includes the use of new biologicals such as rotavirus and pneumococcus, which

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<table>
<thead>
<tr>
<th>Causes</th>
<th>ICD-10 code</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms, signs, and ill-defined conditions</td>
<td>R00–R99</td>
<td>9,509</td>
<td>9,466</td>
<td>10,578</td>
<td>10,529</td>
<td>11,995</td>
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<tr>
<td>Communicable diseases</td>
<td>A00–B99, G00–G03, J00–J22</td>
<td>34,038</td>
<td>33,983</td>
<td>33,410</td>
<td>34,168</td>
<td>36,607</td>
</tr>
<tr>
<td>Neoplasms</td>
<td>C00–D48</td>
<td>66,464</td>
<td>67,274</td>
<td>68,815</td>
<td>71,074</td>
<td>72,627</td>
</tr>
<tr>
<td>Diseases of the circulatory system</td>
<td>I00–I99</td>
<td>112,025</td>
<td>111,999</td>
<td>119,806</td>
<td>126,420</td>
<td>131,832</td>
</tr>
<tr>
<td>Certain conditions originating in the perinatal period</td>
<td>P00–P96</td>
<td>16,449</td>
<td>15,388</td>
<td>15,000</td>
<td>14,768</td>
<td>14,728</td>
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<tr>
<td>External causes</td>
<td>V01–Y89</td>
<td>53,110</td>
<td>53,854</td>
<td>55,029</td>
<td>60,174</td>
<td>67,409</td>
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<tr>
<td>All other diseases</td>
<td>All other diseases</td>
<td>203,645</td>
<td>202,507</td>
<td>211,782</td>
<td>222,397</td>
<td>229,475</td>
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<tr>
<td>Total</td>
<td>A00–Y98</td>
<td>495,240</td>
<td>494,471</td>
<td>514,420</td>
<td>539,530</td>
<td>564,673</td>
</tr>
</tbody>
</table>

**Source:** General Directorate of Information of the Secretariat of Health of Mexico.
has helped to reduce the frequency of hospitalizations for these infections. Measles vaccination coverage was 75.3% in 1990 and 95.6% in 2009, which reflects a 20% increase in coverage over a 20-year period. The main strategies behind these results have been the national vaccination weeks, the “Arranque Parejo en la Vida” (“Equal Start in Life”) program, and the permanent vaccination campaign (1).

Neglected Diseases and Other Infections Related to Poverty

Mexico adopted the multiagent chemotherapy strategy for the treatment of leprosy in 1990, although the use of this treatment has declined gradually but steadily since that time. In 2010 the national prevalence of leprosy had declined to just 437 cases. In 1994, the country met the World Health Organization target of eliminating this disease as a public health problem by reducing its prevalence to less than one case per 10,000 population. Even so, the country has maintained its activities for the control and elimination of leprosy at the municipal level, with plans to intensify them in areas termed “priority,” consisting of 22 municipalities that still present rates above one case per 10,000 population (18).

HIV/AIDS and Other Sexually-transmitted Infections

Mexico has a concentrated AIDS epidemic in which the prevalence of HIV infection is spread among certain population subgroups. An estimated 61,000 people were infected with HIV/AIDS in 1990; that figure climbed to 220,000 in 2009, reflecting an increase of more than 260% between those two years. According to 2009 data from the National Center for HIV/AIDS Prevention and Control, 59% of those living with HIV that year were unaware of it, 14% had been diagnosed as carriers who did not yet require antiretroviral therapy, and 27% were receiving such therapy in a public or private health facility (1).

Tuberculosis

Tuberculosis is a public health priority in Mexico. In 2010, 18,850 new cases of this disease were recorded—15,385 of them being the pulmonary form—and in 2009, it was responsible for 2,222 deaths. Since 2009, the country has had enough medicines available to complete the necessary treatment programs with second-line drugs. This is part of a strategy based on continuous training and ongoing advisory services from a group of experts at the national and state levels that address comorbidities linked to tuberculosis such as HIV/AIDS and diabetes mellitus. Although a decline in incidence was not observed in the 2006–2010 period, significant progress over the decade is apparent: there has been a 33% decline relative to 1997 when incidence levels were at their highest and in 2010 there was a 75% reduction in mortality from tuberculosis and a cure rate of 85.3% (18).

Emerging Diseases

Between January 2009 and August 2010 the Directorate General of Epidemiology recorded 231,960 suspected cases of influenza A(H1N1), 72,731 of which were confirmed. The earliest deaths attributed to the virus appeared in intensive care units and, in some cases, in the home. The highest concentrations of deaths were recorded in epidemiological week 17 and between weeks 36 and 50 of 2009; transmission began to diminish during week 15 of 2010 (2).

Chronic, Noncommunicable Diseases

Cardiovascular Diseases

An analysis of mortality from ischemic heart diseases by federal entity in 2009 reveals significant disparities. Sonora, the state with the highest death rates from this cause in the country, recorded 26.3 deaths per 100,000 population under age 65. This means that the risk of dying of ischemic heart diseases is 3.6 times higher in Sonora than in Quintana Roo, which reported the lowest mortality rate—7.3 deaths per 100,000 population—from this cause.

Malignant Neoplasms

Between January 2007 and August 2009, cumulative mortality from cervical and breast cancer was 36.4
and 42.7 per 100,000 women aged 25 years and older, respectively. In 2009, mortality from cervical cancer was estimated at 12.9 deaths per 100,000 women in the same age group, which was slightly lower (5.4%) than the 13.6 deaths per 100,000 reported in 2008 and markedly lower (32%) than the 2000 rate of 19.2. In contrast, mortality from breast cancer shows an upward trend, increasing by 12% from 1990 to 2000 (from 13 to 14.6 deaths per 100,000 women aged 25 years and older) and by 14% from 2001 to 2009. This rate had risen to 16.9 deaths per 100,000 women aged 25 years and older in 2009 (1).

Diabetes

Diabetes mellitus is an emerging public health problem in Mexico that must be addressed. Prevalence increased from 2000 to 2009 and diabetes was responsible for 77,699 deaths in 2009 alone, accounting for 14.7% of total deaths registered in the country. This disease has been the leading cause of death nationally for several years. In the 1990–2009 period, moreover, there was a troubling increase in mortality from this disease that mainly affected men (234%), compared to women (181%). The country set a national goal of maintaining the increase in mortality from diabetes at no more than 3.92% annually during the 2008–2012 period, so that mortality from diabetes mellitus in 2012 would not exceed 82.4 deaths per 100,000 population. In 2009 the Federal District reported the highest rate in the country with 104.7 deaths per 100,000 population, followed by Tlaxcala with 93.4, while, at the opposite extreme, Quintana Roo reported the lowest rate, with 35.6 deaths per 100,000 population. This means that, leaving other variables aside, the risk of dying from diabetes mellitus is 2.9 times higher in the Federal District than in Quintana Roo. Although mortality from this disease tends to be higher among women, the rates were higher for men in the Federal District, Colima, Michoacán, Quintana Roo, and Baja California Sur, with the Federal District reporting the greatest difference (1).

Disasters

Cyclones, hurricanes, and storms have been the most common types of disasters to strike Mexico. According to the Secretariat of Health, 415 hydro-meteorologic events were recorded from 2006 to 2007, as well as 201 accidents including fires, explosions, and chemical spills (19). Twenty-three emergencies were declared in 2009 due to natural disasters. The major natural disasters in 2010 included weather-related events in Mexico City and in the states of Mexico, Guerrero, and Michoacán; the earthquake that affected the state of Baja California; and Hurricane Alex, which devastated the states of Coahuila, Nuevo León, and Tamaulipas (20).

Mental Disorders

Currently 50% of all mental patients in Mexico receive hospital care and just 30% of primary health care facilities have evaluation and treatment protocols in place for key mental health conditions. Despite efforts to shift the paradigm toward community-based mental health care throughout the country, treatment of these disorders is still predicated on tertiary-level care, as evidenced by the 46 psychiatric hospitals that are available, compared to just 13 inpatient units in general hospitals and 8 residential establishments.

Risk and Protection Factors

Tobacco, Alcohol, and Illegal Drugs

Smoking is considered to be one of the main public health problems in Mexico and illnesses attributable to tobacco use are responsible for some 60,000 deaths annually. The main causes of smoking-related mortality are ischemic heart disease, pulmonary emphysema, cerebrovascular disease, and pulmonary cancer. Nearly 18.5% of Mexicans smoke, or approximately 14 million people between the ages of 12 and 65. Since the enactment of the General Law on Tobacco Control in 2008, the country has made significant progress in fulfilling the
commitments set out in the WHO Framework Convention on Tobacco Control.

Alcohol use is considered the gateway to other forms of drug use. It is the leading cause of death in young people and the fourth leading cause of overall mortality. Six out of every 100 people die each year from cirrhosis of the liver derived from harmful alcohol use. It is estimated that nearly 27 million Mexicans drink infrequently, but in excessive quantities. From 2002 to 2008, the use of marijuana, cocaine and its derivatives, heroin, methamphetamines, hallucinogens, and inhalants increased from 4.6% to 5.2% (21, 22, 23).

HEALTH POLICIES, THE HEALTH SYSTEM, AND SOCIAL PROTECTION

The Health System’s Stewardship Role

The Secretariat of Health is responsible for stewardship of the national health system in Mexico (24). The National Health Council (CONASA) also performs a steering function at the level of the 32 federal entities, with their various components, and the territorial coordination of national health policy. The state secretariats of health coordinate and carry out national and local health policies in conjunction with the various stakeholders (25). The National Health Program 2007–2012 (PRONASA) and the Health Sector Program 2007–2012 (PROSESA) are responsible for ensuring access to basic services and for reducing inequalities through targeted interventions in marginalized communities and vulnerable groups.

The Health System’s Performance

The segmentation of Mexico’s National Health System gives rise to obvious disparities in people’s access to health care services, and the system’s fragmentation undermines its cost-effectiveness. Despite significant investments in infrastructure by the Secretariat of Health and increased budget allotments for health during this period, the consolidation of an equitable system with a universal social and health response that is not influenced by the socioeconomic gradient continues to face obstacles. The Comprehensive Health Quality program (Sistema Integral de Calidad or SiCalidad) operated by the Secretariat of Health and the National Medical Arbitration Commission (recently designated as a PAHO/WHO Collaborating Center) effectively channels quality of care and patient safety as an integrating force for the different entities that make up the health system.

Intersectoral Action and Health

The “Opportunities” (1997) and “Food Support” (2010) programs under the Secretariat of Social Development deliver cash, food, scholarships, and free health packages to 5.8 million poor households. Beneficiary families must visit their nearest health unit at least once every six months to obtain the health services set forth in their national health cards. Working in conjunction with the civil protection office of the Secretariat of Government, the health sector is implementing strategies such as the “Safe Hospital” program in response to major natural hazards affecting the health sector. Another intersectoral initiative was the 2010 creation of the National Council on Chronic Diseases, which relies on the participation of the Secretariats of Treasury, Agriculture, Education, Labor, and the Economy, as well as the private sector.

Social Protection in Health

Workers in the formal sector comprise 64.5 million beneficiaries who, in 2010, were enrolled with the Mexican Social Security Institute (IMSS), the Insurance and Social Security Institute for State Workers (ISSSTE), Mexican Petroleum (PEMEX), the Secretariat of National Defense (SEDENA), and the Secretariat of the Navy (SEMAR). The Popular Insurance program helps give effect to Article 4 of the Constitution, which stipulates that “Every person has the right to health protection. The law shall define the bases and modalities for access to health services” (26, 27, 28). Membership in the Popular Insurance program grew from 15.7 million in 2006 to 40 million
in 2010, although many Mexicans have more than one insurance regimen or carrier.

Also in 2010, the population of health services users comprised 45.2 million beneficiaries who visited health services and 42.7 million people who accessed those services through the Popular Insurance program, the federal or state secretariats of health, and the IMSS’s “Opportunities” program. Popular Insurance provides for 275 interventions included in the Universal List of Essential Health Services, covering nearly 1,500 ailments which, in 2010, accounted for 100% of primary care, 95% of secondary care, and 60% of illnesses that entail catastrophic expenditure, including 57 high-cost interventions through the Catastrophic Expenditures Fund. Health coverage is supplemented by Health Insurance for a New Generation, which has provided coverage to nearly 5 million children from birth since it was established in 2006.

Health Legislation

One constraint on stewardship of national health policy—as it is defined in the General Health Law—is the lack of binding regulations and the existence of specific laws governing the operation of health institutions. This requires additional leadership from the Federal Executive Branch through the Secretary of Health, as well as agreements among the various political stakeholders in the sector. The diversity of regulations currently governing the operation of health institutions is one of the most important problems that must be addressed in order to achieve the functional integration of the national health system. At the regulatory level, the National Commission on Social Health Protection (CNPSS) and the Federal Commission for Protection against Health Risks (COFEPRIS) deal with financial protection and health hazards, respectively.

Health Expenditures and Financing

Mexico’s health system is financed by general taxes, employee and employer contributions, household out-of-pocket payments, and private health insurance premiums. The Popular Insurance program (Seguro Popular) was established to channel public funds—and thus achieve more equity in access to health services—through joint contributions from the federal and state governments. In 2009, health expenditure amounted to 6.9% of the GDP. It should be noted that 47.7% of the total comes from out-of-pocket expenditures and 59% of that went to purchasing medicines. In 2006, 3.73% of households faced catastrophic health expenditures and the goal established for 2012 was to reduce this percentage by 10% in order to prevent impoverishment for health-related reasons (26, 27, 28, 29, 30, 31, 32, 33, 34).

Human Resource Development Policies

Various public and private academic institutions are responsible for the education and training of health workers in Mexico. There is no policy for human resources for health, nor is there any regulatory plan governing the training of professionals based on the health sector’s needs. The prevailing, hospital-centered model appears to be shifting toward an integrated health care model (MIDAS), whose components will reflect a primary care focus. General or family practitioners, with a ratio of 15 per 10,000 population, are proportionately less numerous (6:9) than their specialist colleagues. The ratio of nurses is 22 per 10,000 population and the nurse/physician ratio barely reaches 1.4, which is well below the average ratio in countries of the Organization for Economic Cooperation and Development (OECD). The challenges ahead include placing a higher value on family doctors, nurses, and the health team as a whole.

The Health Services

Because the health system is segmented, various providers are responsible for the delivery of services. These providers are divided into three categories depending on the population they serve: public providers for the population with social security;
public providers for the uninsured, regardless of whether they are enrolled in the Popular Insurance program; and private providers for those with the ability to pay. Facilities belonging to five institutions, IMSS, ISSSTE, PEMEX, SEDENA, and SEMAR, provide services to the population with social security. In this context of fragmentation, with the exception of new mechanisms and certain agreements for the exchange of services, the challenge lies in harmonizing service delivery among the different entities surrounding the state health secretariats with the decentralized public agencies and the Social Security entities present at this level.

The Secretariat of Health (federal) brings together 18 facilities—including the 12 highly specialized national institutes—that support the other levels of care. The country has 20,002 outpatient and hospitalization units (79,000 beds) and 62,239 physicians’ offices, 30% of which are general or family practitioners. (By way of comparison, the private sector has 6.6 times fewer units and 4.4 times fewer physicians’ offices.) The 565 medical specialty units (UNEMES), which were established in 2006, are premised on a new ambulatory care model and cover, among other needs, addictions (309 units), chronic diseases (95 units), HIV/AIDS and other sexually-transmitted infections (71 units), and mental health (44 units). The IMSS Opportunities program, which serves more than 10 million people, is predicated on two aspects of primary health care: medical care and community action. Finally, persons with disabilities, children, women, older adults with difficulties, and other socially vulnerable groups may also obtain care from qualified personnel through the Integrated Family Development system at the national, state, and municipal levels.

**Medicines and Health Technologies**

The judicial branch of the federal government has declared that the public health services are obligated to provide medicines, with an emphasis on expanding access. Mexico spends 28.3% of its total budget allocations for health on medicines, far surpassing the average 17.2% allocated for this purpose in OECD countries. In this context, the strategies adopted by the Secretariat of Health have promoted the establishment of the Coordinating Committee for Negotiating the Prices of Medicines and other Health Supplies, a policy that promotes generic drugs and eliminates plant requirements in order to make them more accessible. In 2009, the Secretariat’s National Center for Health Technology Excellence (CENETEC), a PAHO/WHO Collaborating Center, directed the production of over 300 “clinical practice guidelines”—with a target of 450 for 2012—and promoted a culture of evaluating technologies prior to their incorporation into the health system.

**KNOWLEDGE, TECHNOLOGY, INFORMATION, AND HUMAN RESOURCE MANAGEMENT**

According to the fourth Federal Government Report (2010), the National Council for Science and Technology granted 35,000 scholarships for graduate studies, 68% of them to graduates in the sciences and engineering, which reflected a growing emphasis on providing educational opportunities in strategic development areas. According to the Science and Technology Information System, in 2010, the National Research System had accredited 16,598 researchers (66.75% men and 33.25% women).

**HEALTH AND INTERNATIONAL COOPERATION**

According to the fifth activities report of the Secretariat of Foreign Affairs of Mexico, the country participated with regional agencies to approve the governance of the Mesoamerican Public Health System (SMSP). The SMSP has been active in several areas during this initial phase, including maternal and child health, vaccination, nutrition, and vector-borne diseases, and its programs have trained 332 civil servants in the countries of the region. Other efforts have included promoting the
development of the Mesoamerican Environmental Sustainability Strategy (EMSA) for environmental issues and the Mesoamerican Territorial Information System (SMIT) for natural disaster risk reduction. Mexico has worked with Canada and the United States to continue strengthening the North American Free Trade Agreement (NAFTA), with a focus on modernization along the border with the United States. On the critical issue of migration, Mexico has brought to bear all of the resources at its disposal to ensure respect for the rights of its citizens abroad. Mexico has also continued to work with the United States on implementation of the Merida Initiative to combat transnational crime and continues to operate a temporary agricultural workers program with Canada.

SYNTHESIS AND PROSPECTS

Mexico has achieved positive outcomes in five health indicators: measles vaccination coverage for 1-year-old children; the prevalence of underweight children under age 5; average number of prenatal visits in public health institutions; treatment of confirmed malaria cases; and prevalence of HIV/AIDS. Other indicators have also shown improvement, including infant mortality, mortality in children under age 5, deliveries attended by skilled health workers, dengue prevention and control, and mortality from tuberculosis in all its forms. The main challenges for the future include reducing maternal mortality and prevention and control of chronic, noncommunicable diseases.

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