INTRODUCTION

Peru, located in the central and western area of South America, has a surface area of 1,285,215 km$^2$. It is divided into 25 regions (previously known as departments), in addition to Metropolitan Lima, the capital city, 195 provinces, and 1,834 municipalities. In 2010, the country’s population was 29,461,933. Of that total, 30% was under 15 years old, 8.6% was more than 60 years old, and 74.0% lived in urban areas (Figure 1). In the 2005–2010 period, the total fertility rate was 2.6 children per woman, the crude birth rate 21.4 per 1,000, the crude death rate 5.4 per 1,000, net migration $-4.4$ per 1,000, and total population growth $11.6$ per 1,000. Life expectancy at birth was 73.1 years (70.5 for men and 75.8 for women) (1).

Between 2006 and 2010, Peru’s economy grew 31%, with an annual rate above 7.7%, with the exception of 2009, when it only grew 0.9% due to the
world recession following the 2008 financial crisis. The per capita gross domestic product (GDP) increased 20% over the same period. For 2010, the International Monetary Fund estimated a per capita GDP of US$ 5,196, equivalent to US$ 9,281 adjusted for purchasing power parity (2). Inflation has been lower than 4%, with the exception of 2008, when it was 6.7%. Since 2003, the country’s nuevo sol currency appreciated with respect to the U.S. dollar, and the exchange rate went from 3.5 nuevos soles per dollar in 2003 to 2.8 in 2010; the Central Bank maintains a free market policy for the exchange rate. Net international reserves increased by 155%, going from US$ 17,275 million to US$ 44,105 million (3). Between 2001 and 2009, foreign investment rose 43%. The principal countries of origin of the investment are Spain, the United States, and the United Kingdom. The sectors in which foreign capital is invested include mining (21%), telecommunications (20%), the financial sector (15%), and industry (15%).

In June 2011 the Government announced the “Peru 2021 Bicentennial Plan,” with national development policies for the next 10 years. The plan’s goals include doubling per capita income, reducing those in poverty to less than 10% of the population, eliminating infant mortality and chronic malnutrition, and improving educational quality and coverage for health and social security.

HEALTH DETERMINANTS AND INEQUALITIES

Despite good economic performance, with impressive macroeconomic results, a marked concentration of income persists. In 2009, the income of the richest quintile was 12.5 times greater than that of the poorest quintile, accounting for 52.6% of national income, compared with 4.2% for the poorest quintile. Between 2005 and 2010, total poverty was reduced from 48.7% to 31.3%, and extreme poverty from 17.1% to 9.6%. However, there is still a large difference between urban and rural areas, both in total poverty (19.1% and 54.2%, respectively) and in extreme poverty (2.5% and 23.3%, respectively) (4). In 2009, 4.0% of the economically active population of the country was unemployed and 44.4% were underemployed. In Metropolitan Lima, unemployment amounted to 6.3% (8.9% for women and 4.3% for men); 44.0% of salaried workers worked more than 48 hours a week and 8.7% worked less than that time (5). Of all workers, 61.9% were in the informal sector, which means that they did not have health insurance or other kinds of social benefits, despite the sustained economic growth of the last 10 years. In part, this is due to the economic model (which gives special importance to developing sectors aimed at raw material
exports—which create few jobs), as well as to the deregulation of the job market.

The illiteracy rate was reduced from 12.8% in 1993 to 7.1% in 2007. It is higher in the rural areas (19.7%) than in urban areas (3.7%), and greater among women (10.6%) than among men (3.6%). The average number of years of education is lower in rural than in urban areas (6.4 and 10.9 years, respectively). Between 2005 and 2009, the percentage of women over 15 years of age with a university-level higher education increased from 8.7% to 12.1%, while among men it went from 11.1% to 14.3%.

In 2010, poverty affected 51.8% of people who had Quechua, Aymara, or an Amazonian language as their mother language, compared with 25.8% of those with Spanish as their mother language. Similarly, extreme poverty affected, respectively, 21.7% and 6.6% of the persons in those two language groups (4). The indigenous population lives mainly in the rural areas of the country, where conditions of life and health are very insecure (Table 1). For example, in rural areas the poverty rate is almost three times as high as in urban areas. Extreme poverty is approximately 10 times as high, infant mortality nearly double, and chronic malnutrition almost triple that in the urban areas.

THE ENVIRONMENT AND HUMAN SECURITY

Access to Clean Water and Sanitation

In 2010, 76.4% of households received water through a public supply network. Coverage of this service was greater for nonpoor households (69.0%) than for poor ones (40.0%). Eighteen percent of all households and 36.6% of poor households were supplied with water from a river, canal, spring, or similar source. Only 57.5% of households had a connection to the public network for sewerage; 27.6% had a latrine, septic tank, or cesspool; and 14.9% did not have any system of excreta disposal, a percentage that rose to 30.3% in the rural areas.

In 2003, only 11.7% of the indigenous population of the Amazon region had any kind of water supply system, usually a well and public standpipe. Further, water disinfection was carried out in almost none of the communities of the Amazon region, and, where it was done, it was done intermittently. Only 9.7% had any excreta disposal system, mainly latrines.

Solid Waste

In 2009, 74.0% of the population had services for solid waste collection. Of the 8,532 daily tons of refuse collected, 66.0% received some form of final disposal (14.7% was recycled and the remainder went to sanitary landfills), while the remainder went into the environment (principally rivers and beaches). In Metropolitan Lima, only 57.6% of the solid waste reaches a sanitary landfill, which results in severe environmental pollution that endangers the stability of ecosystems and people’s health.

Water Pollution

In 2009, only 35.0% of wastewater received any kind of treatment before final disposal, mainly in the city of Lima. Another important source of water pollution is industrial activity, especially mining. Water quality monitoring in 2010 showed that the majority of watersheds were contaminated with lead, arsenic, and cadmium. In some places, the bioconcentration of metals exceeded food quality standards by several times, as was the case for mercury in fish sold in the public market of the city of Puerto Maldonado.

Air Pollution

Air quality is poor in the metropolitan areas of Lima, El Callao, and Arequipa, and in the industrial urban centers of Chimbote, Ilo, and Cerro de Pasco. This is due to industrial development without adequate contamination control and to the increasing number
and poor condition of vehicles in circulation. In 2009, measurements in Lima showed a concentration of particles smaller than 2.5 μm in diameter with a monthly average of 70 μg/m³, far exceeding the standard of 15 μg/m³. In contrast, for two substances, the concentrations found were below the national criteria: sulfur dioxide (monthly average of 24 μg/m³, vs. the standard of 80 μg/m³) and nitrogen dioxide (monthly average of 37 μg/m³, vs. the standard of 200 μg/m³).

**PESTICIDES**

The use of the chlorinated pesticides aldrin, endrin, dieldrin, chlordane, mirex, heptachlor, and toxaphene is prohibited in Peru. In 2003 an inventory of sources of emission of dioxins and furans in the city of Lima found dioxin levels of 21 ng/g, while the standard values in WHO-TEQ\(^1\) are from 0.0072 to 14 ng/g.

---

1 The overall toxicity of dioxins is expressed in toxic-equivalent values, which are calculated by summing the toxic-equivalence level of each congener by its concentration in the sample.

**HEALTH CONDITIONS AND TRENDS**

**Health Problems of Specific Population Groups**

**Maternal and Reproductive Health**

Women of childbearing age (from 15 to 49 years old) make up one fourth of the total population of the country. Of this group, 48.1% are less than 30 years old. The total fertility rate declined from 2.9 children per woman in 2000 to 2.5 in 2010 (3.5 in the rural areas and 2.2 in the urban areas). Women without education and women in the lower income quintile had higher fertility rates, 3.6 and 4.0 children per woman, respectively. The average birth interval increased from 36.9 months to 48.4 months over the same period. There was no significant change in pregnancy among adolescents. In 2010, 13.5% of all adolescents had been pregnant at least once (33.7% of adolescents with primary education and 26.2% of those residing in forest areas).

In 2010, 74.4% of all women from 15 to 49 years old in stable relationships used some form of contraception, an increase of 5.5 percentage points from 2000. The modern contraception methods used most often are injectable contraceptives (17.5%), condoms (11.2%), feminine sterilization (9.4%), and

---

**TABLE 1. Health and living conditions, by urban and rural population, Peru, 2010.**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>National</td>
</tr>
<tr>
<td>Poverty (%)</td>
<td>31.3</td>
</tr>
<tr>
<td>Extreme poverty (%)</td>
<td>9.6</td>
</tr>
<tr>
<td>Sewerage service from public network (%)</td>
<td>64.8</td>
</tr>
<tr>
<td>Water service from public network (%)</td>
<td>76.8</td>
</tr>
<tr>
<td>Institutional care in childbirth (%)</td>
<td>81.0</td>
</tr>
<tr>
<td>Infant mortality (per 1,000 live births)</td>
<td>17.0</td>
</tr>
<tr>
<td>Child mortality (per 1,000 live births)</td>
<td>23.0</td>
</tr>
<tr>
<td>Low birthweight (%)</td>
<td>8.0</td>
</tr>
<tr>
<td>Chronic malnutrition (%)</td>
<td>23.2</td>
</tr>
<tr>
<td>Anemia in children under 5 (%)</td>
<td>37.7</td>
</tr>
</tbody>
</table>

Source: References (4, 6).
the pill (8.3%) (6). The largest supplier of contraceptives continues to be the public sector.

Maternal mortality was reduced from 185 per 100,000 live births in 2000 to 93 per 100,000 in 2010. While indicating substantial progress, this lower rate is still far from the goal set by the Millennium Development Goals, of 66 per 100,000 live births. This improvement is attributable to the increase in childbirths in institutions (from 58% in 2000 to 82% in 2009), to the adaptation of maternal care in pregnancy and childbirth to make it culturally appropriate, and to the establishment of birthing homes. More than 50% of maternal deaths are concentrated in eight regions: Cajamarca, Puno, La Libertad, Loreto, Piura, Junín, Huánuco, and Cusco. Poor, rural, and indigenous women have higher risks of maternal death. The principal causes of maternal mortality are post-delivery hemorrhage (45%), hypertension (30%), abortion (9%), infections (6%), unspecified causes (9%), and abnormalities in the process of childbirth (1%) (7).

Children (under 5 years old)

In 2010, children under 5 years old made up 12.0% of the population (3,546,840). In this group, chronic malnutrition (using the criteria of the WHO Child Growth Reference Standards) declined from 31.3% in 2000 to 23.2% in 2010 (6), but there was still a wide difference between urban and rural areas (14.1% and 38.8%, respectively). In 2010, anemia affected 50.3% of children from 6 to 36 months old.

The infant mortality rate fell from 33 per 1,000 live births in 2000 to 17 per 1,000 in 2010 (although still with a wide difference between urban and rural areas: 14 per 1,000 live births and 22 per 1,000, respectively). Mortality in childhood dropped from 47 per 1,000 live births to 23 per 1,000 over the same period. However, as in the case of infant mortality, a wide difference still existed in 2010 between urban and rural areas (17 per 1,000 live births and 33 per 1,000, respectively). In part, this progress on mortality has been due to implementing policies targeted at reducing poverty, such as the GROW (CRECER) National Strategy and the TOGETHER (JUNTOS) National Program for Direct Support to the Poorest, as well as improving people’s access to the health services.

In 2010, 99.1% of children under 5 had been breast-fed at some time (92.0% in their first day of life), although 32.0% received some other kind of food before beginning to breast-feed. Of children less than 6 months old, 64.7% received exclusive breast-feeding, with a median duration of 4.2 months.

Children and Adolescents (10 to 19 years old)

In 2010, the age group 10–19 years old amounted to 3.5 million (12.0% of the total population). Among adolescents, 20.1% were not attending any educational institution or had dropped out. In the 2000–2010 period, the specific fertility rate of women from 15 to 19 years old increased from 66 to 68 births per 1,000 women, with a wide urban-rural difference (54 and 110 per 1,000, respectively).

In 2004, overweight affected 11% of adolescents; the highest prevalence was in Tacna (18%) and Lima (17%) (8). That same year another study, conducted in the city of Piura, showed that 13.4% of adolescent women were overweight and 2.1% were obese, while among men these values were 14.7% and 6.1%, respectively (9).

Consumption of alcohol and other substances starts early in life: in 2006, 36.0% of adolescents from 12 to 18 years old had already consumed alcohol, 21.0% tobacco, 1.2% marijuana, 0.5% cocaine base paste, and 0.4% cocaine (10). In 2005, 2.9% of adolescents in the cities in the mountains, 1.7% of those in forest areas, and 3.6% of those in the city of Lima had attempted to commit suicide at some time in life (11). The principal reasons for which they attempted suicide were related to family problems. Traffic accidents were the leading cause of death among adolescents (10.3%), followed by cerebrovascular diseases (8.1%), pneumonia (5.8%), malignant neoplasms (5.6%), and tuberculosis (3.4%).

The Elderly (60 years old and older)

The adult population aged 60 and over is growing at a faster rate than the total population of the country
(an annual average of 3.3% in the period between the censuses of 1993 and 2007). In 2010, those over 60 years old represented 8.6% of the population. In 2007, acute respiratory infections were the leading cause of death among those over 60 years old, followed by ischemic heart disease and cerebrovascular diseases; malignant stomach neoplasms were the leading cause of death from tumors (12).

Workers

The Social Security system encompasses 25% of the national population and provides compulsory insurance to 26% of the economically active population (3,918,676 in June 2008), in particular to salaried workers.

In 2010, the Ministry of Labor and Promotion of Employment confirmed 277 occupational accidents, which occurred mainly in the departments of Lima (28.9%), La Libertad (28.9%), Piura (14.8%), and Junin (9.0%). Of these, 30.9% took place in manufacturing, 17% in construction, and 10.1% in activities related to furniture moving and building cleaning; only 4.7% were recorded in the mining and quarry sector (Ministry of Labor and Promotion of Employment, Statistical Yearbook 2010). Of these accidents, 18.4% caused internal injuries, 13.7% contusions, 11.9% amputations, and 9.4% open wounds. Seventeen percent came from being trapped, 12.3% by falls from heights, 9.4% by falling objects, and 6.9% by falls on level ground. In 58.9% of accidents, the result was temporary disability, in 5.8% permanent disability, and in 20.6% the death of the worker.

Mortality

Communicable diseases continue to be the leading cause of death in Peru. In 2007, the standardized mortality rate for major groups of causes was 126.4 per 100,000 population for communicable diseases, 114.3 for tumors, 101.1 for diseases of the circulatory system, and 74.6 for external causes. Over the 2004–2007 period, the principal causes of mortality did not change. Acute respiratory infections were the leading cause of death, followed by several chronic diseases and tumors (Table 2); septicemia and tuberculosis also caused substantial mortality.

The malignant neoplasms that caused the highest mortality were those of the stomach (21.0); trachea, bronchus, and lung (10.7); prostate (10.4); colon and rectosigmoid junction (5.9); cervix (5.7); leukemia (5.4); and breast in women (4.7) (13).

Morbidity

Communicable Diseases

Vector-borne Diseases

It is estimated that 13 million people live in areas of malaria transmission risk (1.2 million in high-risk areas). Between 2005 and 2010 the number of cases of malaria dropped from 87,669 to 29,257 (14). The infectious agent was *Plasmodium vivax* in 91.8% of cases and *Plasmodium falciparum* in the remainder. In 2010 a single death was reported. Of the cases reported, 87% were in the Amazon forest; the remainder were on the northern coast.

Beginning in 2006, there was a sustained increase in cases of dengue, from 3,695 in 2006 to 13,031 in 2010. The last outbreak occurred in February 2011, with the Asian/American serotype 2 identified; by June 2011, 27,404 cases had been reported, 171 of them severe, and there were 27 deaths. The *Aedes aegypti* vector has a broad distribution, infesting the principal cities in forest areas and on the coast, including the city of Lima. The four dengue virus serotypes circulate in the country. The Ministry of Health carries out prevention and control activities within the framework of the integrated management strategy against dengue.

Between 2005 and 2010, important progress was made in control of Chagas’ disease, and the elimination of vector-borne transmission was certified in two of the three departments where the disease is endemic, in Tacna and Moquegua. Vector control work continues in Arequipa, another affected department, where it is hoped to achieve the goal of elimination of vector-borne transmission by 2014.
The prevalence of *Trypanosoma cruzi* in blood banks in the endemic areas is 0.8%.

Some 8,000 cases a year are reported of leishmaniasis, which is widely distributed in the mountains and in the forest areas. In Peru, there are two clinical forms, cutaneous and mucocutaneous, with the latter occurring only in the Amazon forest area. In 2010, 7,689 cases were reported, 95.0% of them in the cutaneous form. Of the reported cases, 60.8% came from the departments of Cusco, San Martín, Cajamarca, Junín, Piura, and Amazonas.

In Peru there are enzootic yellow fever areas in the Amazon forest area, where sporadic outbreaks occur among temporary workers who enter the forest for seasonal planting or harvesting. Over the period of 2006 through 2010, the numbers of cases reported per year were, respectively, 68, 72, 52, 29, and 63. Among the 63 cases reported in 2010, 18 were confirmed, and there were 14 deaths.

### Vaccine-preventable Diseases

Between 2006 and 2010 there were substantial changes in the vaccination schedule for the country, increasing the number of immunobiologicals from 7 to 16, and with investment growing from US$ 10 million to US$ 100 million. In this period pneumococcal vaccines were introduced for rotavirus, influenza, and pandemic influenza; the human papillomavirus vaccine began to be applied in 2011.

In 2006 there was a vaccination campaign against measles and rubella within the framework of eliminating measles, rubella, and congenital rubella syndrome, with the goal of vaccinating 20 million people from 2 to 39 years old. National coverage above 95% was achieved. In 2007 the Accelerated Plan against Yellow Fever was implemented, with the target of vaccinating 11 million people from 2 to 59 years old. Coverage of 97% was reached in the 17 regions with areas where the disease is endemic and with places of origin for persons who leave and go to work in those endemic areas. In 2008, vaccination against hepatitis B in people 2 to 19 years old was carried out, with the goal of vaccinating 10 million people; 71% coverage was reached for the third dose.

Between 2006 and 2010, vaccination coverage was over 90%; however, there are still districts without optimal coverage levels. Morbidity and mortality caused by vaccine-preventable diseases have been reduced substantially. In 2009, there were 7,509 reported cases of mumps, one case of neonatal tetanus, one case of meningitis from *Haemophilus influenzae* type b, and 14 cases of whooping cough. No cases of measles, rubella, or congenital rubella syndrome were reported.

### Zoonoses

There is no urban transmission of rabies, with the exception of the department of Puno, where one case occurred in 2006 and another in 2010. Periodically, small outbreaks of rabies transmitted by vampire bats are reported in rural forest areas: annually, from 2006 through 2010, there were 3, 23, 0, 18, and 13 cases reported respectively. There are foci of the plague in areas of extreme poverty of the departments of Cajamarca and La Libertad; between 2006 and 2010, there were 34, 11, 14, 5, and 24 cases reported for the respective years. In 2009 an outbreak occurred in the province of Ascope (La Libertad Region), with 10 cases. In July 2010 there were 4 cases of pulmonary plague, 2 in the province of Ascope and 2 among the personnel of the Regional Hospital of Trujillo, where one of the patients was treated.

---

**TABLE 2. Ten leading causes of mortality (per 100,000 population), Peru, 2007.**

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute respiratory infections</td>
<td>111.6</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>44.8</td>
</tr>
<tr>
<td>Cerebrovascular diseases</td>
<td>31.4</td>
</tr>
<tr>
<td>Septicemia, except for neonatal</td>
<td>27.6</td>
</tr>
<tr>
<td>Cirrhosis and other chronic diseases of the liver</td>
<td>21.3</td>
</tr>
<tr>
<td>Malignant stomach neoplasms</td>
<td>21.0</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>20.4</td>
</tr>
<tr>
<td>Cardiac insufficiency</td>
<td>18.4</td>
</tr>
<tr>
<td>Hypertensive disease</td>
<td>17.1</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>11.0</td>
</tr>
</tbody>
</table>

*Source: Reference (14).*
persistence of plague foci comes from inappropriate storage of crops and the lack of adequate disposal for solid waste.

There are two other zoonoses of importance: liver fascioliasis and hydatidosis. In the areas of the Peruvian altiplano (highlands) that are endemic for liver fascioliasis, prevalence rates of up to 30% in children have been found. Hydatidosis has rates of morbidity in hospitalized patients of 530 per 100,000 population and of mortality from 1% to 12%; the departments of Lima, Junín, Pasco, and Puno report the highest prevalence rates for this disease.

Neglected Diseases and Other Infections Related to Poverty

Between 2006 and 2010, there were 67 new cases of leprosy, all from the Amazon forest; in 2010, Loreto reported 8 cases, Ucayali 4, San Martín 2, Amazonas 1, and Huánuco 1. There are considered to be problems in searching for and detecting cases, in addition to an inadequate system of monitoring and evaluation of the treatment in the patients.

HIV/AIDS and Other Sexually-transmitted Infections

The HIV epidemic is concentrated in men who have sex with other men (between 10% and 20%, according to different studies); the national prevalence of HIV in pregnant women from 15 to 24 years old is 0.23%. The male/female ratio of reported cases of AIDS is 3 to 1. In recent years, more than 1,000 cases of AIDS have been reported annually (1,631 in 2008, 1,103 in 2009, and 1,041 in 2010), along with more than 3,000 cases of HIV infection per year (3,762 in 2008, 3,565 in 2009, and 3,042 in 2010). Between 2004 and 2007, hospital discharges for causes directly related to HIV/AIDS ranged between 1,877 and 1,956. Since 2004, free antiretroviral therapy has been available; in 2010 approximately 16,000 people were receiving treatment. Between 2005 and 2009, expenditure for treatment of HIV/AIDS increased from US$ 28 million to US$ 62 million; half of these funds came from international cooperation (most from projects of the Global Fund to Fight AIDS, Tuberculosis and Malaria). In 2010, the expenditure was reduced to US$ 36 million; US$ 15.4 million came from the public sector and US$ 7.8 million from households.

HIV infection is detected each year in approximately 550 pregnant women (535 in 2008, 550 in 2009, and 592 in 2010); all those women receive antiretroviral therapy.

There were 442 cases of congenital syphilis reported in 2008 and 376 in 2009.

Tuberculosis

Over the 2006–2010 period, morbidity from tuberculosis dropped from 129.3 per 100,000 population to 108.5. In 2010, there were 31,984 new cases reported, and 97% of the expected cases were detected. Eighty percent of cases were diagnosed in the age group from 15 to 59 years old. Of all the TB cases, 59% of the drug-sensitive ones, 82% of the multidrug-resistant ones, and 93% of the extensively multidrug-resistant ones occurred in Lima and El Callao. In 2009, the percentage of cure of new cases was 89%, with 6.2% abandonment of treatment and 2.7% deaths. That same year, 697 cases were identified with coinfection of tuberculosis and HIV (36% of the cases of tuberculosis were analyzed, and 6% turned out to be HIV-positive). Furthermore, 1,361 people with HIV infection received preventive treatment with isoniazid.

In 2009 treatment for multidrug-resistant TB was initiated for 1,856 patients, and the bacteriological conversion at six months of individualized treatment reached 90.3%. In 2007, the percentage of cure was 67%, with 17% abandonment of treatment.

Chronic, Noncommunicable Diseases

Among the main causes of mortality from chronic, noncommunicable diseases are ischemic heart disease (44.8 per 100,000 population); cerebrovascular diseases (31.4); malignant neoplasms of the stomach (21.0); diabetes mellitus (20.4); hypertensive disease (17.1); malignant neoplasms of the trachea, bronchus, and lung (10.7); malignant tumors of the prostate (10.4); malignant neoplasms of the cervix and unspecified locations (8.3); and malignant breast neoplasms in women (4.7).
Only 40% of the adult population carries out any moderate physical activity (16). Overweight affects 35.3% of adults (39.1% of women and 31.1% of men), and obesity 16.5% (20.3% of women and 12.6% of men). The rate for hypercholesterolemia is 19.6%; for hypertriglyceridemia, 15.3%; and for levels of high-density lipoproteins (HDL) higher than 130 mg/dl, 5.3%.

**Nutritional Diseases**

In 2010, iron deficiency anemia continued to be the principal nutritional problem among children under 5 years old, affecting 37.7% of children in that age group. However, comparing that figure with the one reported for the year 2000, there had been a decline of 12 percentage points. Major differences continued to exist among the departments. Some poorer departments had percentages higher than the national average, including in Puno (64.8%), Huancavelica (56.9%), and Ucayali (53.1%). In contrast, the percentages were below the national average in Lambayeque (21.3%) and Piura (27.1%). The age group most affected was from 9 to 12 months old (a prevalence of 72%). Between 2000 and 2010, anemia in women of childbearing age was reduced from 31.6% to 21.5%.

Chronic malnutrition (low height-for-age) in children under 5 was reduced from 31.0% in 2000 to 23.2% in 2010. The decline was greater in rural areas (from 47.3% to 38.8%) than in urban areas (from 18.2% to 14.1%), as well as in the poorer departments of the country. This was the result of the targeting of comprehensive poverty reduction strategies, which included specific actions in the areas of health and nutrition.

**Accidents and Violence**

There are approximately 80,000 traffic accidents a year in the country. Sixty percent of these are in the city of Lima, which has a third of the population of the country (17). Between 2005 and 2007, the average number of injuries per year was 45,149 at the national level and 23,028 in Lima. These accidents caused an average of 3,431 deaths a year in the country, with 757 deaths a year in Lima. The leading causes of fatal accidents were excess speed (25%), pedestrian carelessness (21%), pedestrian drunkenness (17%), driver recklessness (15%), and driver negligence (9%).

In 2010, 67.9% of women ever in a relationship said that their husband or companion had applied some form of control over them. The principal form of control was insisting on knowing where the woman went (50.4%), followed by manifestations of jealousy (43.4%) and blocking her from visiting or being visited by friends (22.1%). Furthermore, 38.4% said that they had suffered physical or sexual violence; 31.1% that their companion had shoved, shaken, or hit them; 24.5% that their companion had slapped them or twisted their arm; 21.3% that their companion had struck them with their fist or other harmful object; and 7.8% that they had been forced to have sex. Physical violence was used more frequently on women with fewer economic resources (6). Only a small proportion of these violent episodes are reported to the respective authorities; in 2007, the National Police received 87,292 complaints of family violence, of which 89.9% affected women (18).

**Disasters**

According to the National Institute for Civil Defense (INDECI), between 2007 and 2010 there were 17,712 emergencies recorded nationally, which produced 1,152 deaths, 5,565 injured, and 746,499 persons suffering other damages. Urban fires were the most frequent emergency (35%), followed by intense rains, strong winds, ice, floods, construction collapses, and landslides. In August 2007 there was an earthquake that had a magnitude of 7.9 on the Richter Scale. Lasting 3 minutes and 30 seconds, it was followed by a tsunami that affected the bay of Pisco. This earthquake caused major damage in Huancavelica, Ica, and Lima, and was classified by the Geophysical Institute of Peru as the most intense earthquake occurring in the preceding 100 years. According to INDECI, the earthquake produced 596 deaths, 1,292 wounded, and 464,314 persons suffering other damages. The
health sector was severely affected, with eight hospitals damaged in the region of Ica. The province of Pisco lost 95% of the available hospital beds, and the province of Chincha lost 40% of its operating capacity.

Mental Disorders

In Peru there are no studies of a national scope on the state of mental health of the population. Studies conducted have been targeted at Lima (19) and at the Peruvian mountain area, which includes the cities of Ayacucho, Cajamarca, and Huaraz (20). These studies have indicated that 37.3% of the population in these areas have had a mental disorder at some time in life. Nineteen percent of the population of Lima and 17% of residents of the cities in the mountains had experienced an episode of depression at some time in life, and 25.3% and 21.1%, respectively, had had an anxiety disorder at some time in life. Psychotic disorders occurred in 1% of the population of Lima. According to the Ministry of Health, mental and behavioral disorders, in particular depression, are the leading cause of illness in the country (21), and are responsible for the loss of almost one million healthy life years. Depression is the most frequent clinical diagnosis associated with suicide (39.4% of cases) (22). Suicide is fourth among the causes of violent death in Lima, and is more frequent in men than in women, by a 2:1 ratio.

Other Health Problems

Oral Health

In 2009, oral diseases were the second most frequent reason for outpatient consultation in the health facilities of the Ministry of Health, representing 8.5% of all consultations (23). In the 2001 national evaluation of oral health among schoolchildren from 6 to 15 years old there was a prevalence of caries of 90.7%, and dental fluorosis was found in 35.7%. The average DMF index was 5.7, although it ranged from 8.3 in Ayacucho to 3.5 in Ancash; in 12-year-old children the index was 3.9.

Despite the great demand for dental services, in 2007 the Ministry of Health had only 1,833 dentists (24).

Risk and Protection Factors

In 2006, 84.6% of the population from 12 to 64 years old had consumed alcohol at least once, and 63.0% had done so in the preceding year. For tobacco, the percentages were 58.8% and 34.7%. The percentages for consumption of illegal drugs were smaller: 3.6% and 0.7% for marijuana, and 1.4% and 0.3% for cocaine and cocaine base paste (25). The average age of beginning consumption of alcohol and tobacco has dropped: in the age group from 12 to 18 years old, it was 14.4 years for alcohol and 14.8 years for tobacco; in the group from 19 to 25, it was 17.0 for alcohol and 16.8 for tobacco; and in the group from 26 to 35, it was 18.2 for alcohol and 19.7 for tobacco. Of those who had consumed alcohol in the preceding year, 8.1% showed signs of dependency, as did 10.3% of those who had used tobacco, 40.3% of those who had used marijuana, and 51.5% of those who had used cocaine.

HEALTH POLICIES, THE HEALTH SYSTEM, AND SOCIAL PROTECTION

The Health System’s Stewardship Role

In 2001 the “Sectoral Policy Guidelines for the Period 2002–2012” were prepared to guide action in the health sector and define the bases for the process of modernizing the sector. In 2006, a new health agenda was designed and published as the Coordinated National Health Plan. This plan has among its objectives developing the capacity of the State to manage and lead the health sector, achieving universal health insurance, adopting cost-effective strategies for the principal activities, improving financing, establishing a system for monitoring and evaluation, increasing citizen participation, and coordinating the interventions of all the stakeholders in the health system. In 2009 the Universal Health Insurance Framework Law was approved, establishing a regulatory framework for insurance and
guaranteeing the progressive right of every person to a set of interventions for various health and disease situations, regardless of their status in the workforce.

**The Health System’s Performance**

In 2010, 62.6% of the population had health insurance: 37.0% in Comprehensive Health Insurance, 20.1% in Social Security, and 5.5% with private insurance. Comprehensive Health Insurance, which is subsidized by the State and offers a package of basic services, will gradually have to match the Social Security benefit plan, which also covers highly complex illnesses.

The health system includes the public and private sectors. The public sector is made up of the Ministry of Health and the Regional Health Bureaus (which have the largest network of public establishments in the country, aimed at serving the poor and indigent), Social Security (which has the second largest network of coverage in the country, exclusively for salaried workers and their family members), and the health networks of the armed forces and police forces. The private sector provides care mainly to the higher-income sector of the population. System efficiency is difficult to achieve due to segmentation and division, insufficient financing, weak leadership by the Ministry of Health, and low participation from other sectors and from citizens.

In 2011 the Model for Comprehensive Care based on the Family and the Community was reviewed and approved, with a package of promotional, preventive, and recovery services, according to the life cycle. The financial viability of this system is under study, through calculation of a capitation fee, in order to establish costs, determine gaps, and identify financing sources.

**Health Expenditures and Financing**

In 2005, total health expenditure amounted to 11,671 million nuevos soles (US$ 3,548 million), a sum that represented 4.5% of GDP (26). Per capita current health expenditure was 429 nuevos soles (US$ 385 adjusted for purchasing power parity). Public spending amounted to 59.4% of total expenditure, and private expenditure was 40.6%. Of the private expenditure, 75.4% was out-of-pocket expenditure, and only 20.8% corresponded to spending on private insurance. Of household expenditure, 40.1% was for purchase of drugs, 43.3% payment for private health services, and 11.6% for public services. Of total health care financing, 30.7% comes from the Government, 34.2% from households, and 30.5% from employers.

**Human Resource Development Policies**

In 2009 there were 7.9 physicians, 9.7 nurses, and 1.2 dentists per 10,000 population, although these personnel were concentrated in the large cities. Lima has three times more physicians per population (15.4) than Huancavelica (4.3). The Ministry of Health has established incentives to encourage work in remote and poor areas, in particular for specialists. Furthermore, the Rural and Marginal Urban Areas Health Service has been reorganized, so that recently graduated health professionals work in health facilities at the primary care level in the poorer areas of the country.

In 2006, the National System for Evaluation, Accreditation, and Certification of Educational Quality was created. One of its responsibilities is to assess the quality of medical schools and accredit them. The certification of health professionals is in its initial stage. There has been progress in defining the instrument for granting certification and for determining the profiles for professional and work competencies, essential knowledge, and expected performance.

In 2008, the Government enacted Decree-Law 1057, creating a new contracting system known as the Special Regime for Administrative Services Contracting. This change represents an improvement in the contracting system, since it establishes a standard contract that specifies length, schedule, activities, social protections, and contributions to the pension system. Job dissatisfaction is widespread
among health workers, and there are multiple complaints about working conditions, technological obsolescence and the poor operating condition of equipment, and the lack of disposable materials and other supplies needed for daily tasks.

**THE HEALTH SERVICES**

**Drugs and Health Technology**

The National Drugs Policy, which was approved in 2004, deals with three issues: universal access, regulation and quality of drugs, and the rational use of drugs. The signing of the Free Trade Agreement with the United States in 2006 entailed changes in several standards to meet the requirements stipulated in that treaty. The approval of Law 29,459, which regulates pharmaceutical products, medical devices, and health products, constitutes an important achievement in establishing stronger requirements for safety, efficacy, quality, and surveillance. The legislation also includes measures aimed at improving people’s access to essential drugs, the security of agreements on trade-related intellectual property rights, and the importance of evaluating technology, research, public information, and many other subjects related to treatment and appropriate usage of drugs and medical devices. In 2010, a single national medical formulary for essential drugs was approved, which is applicable at the intersectoral level (Ministry of Health, Social Security, and Armed Forces).

The National Center for Documentation and Information on Drugs has created a virtual library on drugs, which provides objective information from several recognized databases on pharmaceutical products and health technology. In addition, a drug prices observatory was launched, collecting information from the public and private sectors and supporting transparency on costs, since the country does not have price controls.

Development with respect to medical devices is just beginning, since there are no professionals trained or specialized in this field. There has been little done on health technology assessment, with the exception of drugs. In 2011, the Ministry of Health formed a committee for the assessment of health technologies and high-cost illnesses, with participation from the general directorates of the Ministry of Health and of the National Institute of Health.

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

**Scientific Production in Health**

Between 2000 and 2009, the number of scientific articles from Peru cited in the *Science Citation Index* database increased from 61 to 200. The principal countries that collaborated with Peru in the publication of scientific articles were the United States (60.4%), the United Kingdom (12.9%), and Brazil (8.0%). Of the publications, 94.7% were from Lima. The medical schools with the greatest scientific output are at the Universidad Peruana Cayetano Heredia (UPCH) and the Universidad Nacional Mayor de San Marcos (UNMSM). The UPCH participated in the production of 45% of the country’s scientific articles. The Ministry of Health (including its units) participated in 37% of the total articles. The most frequent publications were research articles (82.1%), letters to the editor (7.4%), editorials (5.1%), and reviews (4.8%).

In 2010, there were two strategies for managing scientific and technical health information at the national level: the Virtual Health Library (VHL) and SciELO. VHL Peru is managed by the Ministry of Health and the Peruvian Network of Health Libraries, and with the UPCH coordinating the Network. The Network developed the Peruvian Literature in Health Sciences database, which has full-text documents for open and cost-free access. SciELO Peru, coordinated by the National Council for Science, Technology, and Technological Innovation, provides access to a selected collection of Peruvian scientific journals in various disciplines. As of 2010, SciELO Peru included 14 journals that have met the defined quality criteria, and the online
A system was receiving an average of 200,000 visits per month.

**HEALTH AND INTERNATIONAL COOPERATION**

Between 2000 and 2009, Peru received almost US$ 500 million per year in technical and financial assistance to promote the country’s development. Of that sum, approximately 9.8% was destined for health and population issues. This financial support represents no more than 2% of total health expenditure, and is therefore minimal in comparison to the total investment that the country itself makes in public and private health programs. The principal bilateral donors were the United States of America, Spain, and Belgium, while the Global Fund to Fight AIDS, Tuberculosis and Malaria was the principal multilateral channel for resources. The primary sectors to which assistance was directed were control of sexually-transmitted infections, among them HIV/AIDS (20%), primary health care (19%), health policies and management (16%), and communicable disease control (13%).

As a full member of the Andean Community and of the Union of South American Nations (UNASUR), and an associate of MERCOSUR, Peru participates in implementation of the health plans of these bodies, particularly in matters concerning access to drugs, strengthening health services, and human resources. Lima is the headquarters for the General Secretariat of the Andean Community and for the Andean Health Agency, which means that the PAHO/WHO Country Office in Peru is responsible for liaison between the PAHO Headquarters and these international entities, with respect to Andean subregional cooperation.

**SYNTHESIS AND PROSPECTS**

In the five-year period of 2006–2010, Peru experienced sustained economic growth. Although poverty was substantially reduced, wide inequalities persist in income distribution. The health situation has improved and, with the exception of maternal mortality, the health-related Millennium Development Goals, as well as those of poverty reduction, should be met. However, access to basic services such as drinking water and sewerage should be increased, particularly in the rural areas. Despite improvements in the health situation, there are large challenges for public health, such as reducing the burden of communicable diseases by eliminating mother-to-child transmission of HIV and congenital syphilis, human rabies transmitted by dogs, and Chagas’ disease; controlling the plague, yellow fever, dengue, malaria, and tuberculosis, especially multidrug-resistant tuberculosis; preventing and controlling noncommunicable chronic diseases, such as malignant neoplasms of the cervix and breast in women; and promoting healthy lifestyles. People’s access to quality health services will be increased by improving the organization of the health sector within the framework of decentralization and universal insurance and by strengthening the steering role of the Ministry of Health and the management capabilities of the Regional Health Bureaus. Achieving this will require better coordination among the health services, a higher public budget, improved mechanisms for referring patients, and expanded activities for promotion and prevention. It is also necessary to strengthen the health information system to enable monitoring and evaluation of health actions as well as measurement of their impact on population health, in particular that of the poorer and excluded groups. Finally, training should be intensified, as well as the exchange of information among the different sectors that deliver health services.

**REFERENCES**