

PERU



Sources: Second Administrative Level Boundaries Dataset (SALB), a dataset that forms part of the United Nations Geographic Database, available at: http://www.who.int/whosis/database/gis/salb/salb_home.htm, and the Digital Chart of the World (DCW) located at: <http://www.maproom.psu.edu/dcw>. The boundaries and names shown here are intended for illustration purposes only, and do not imply official endorsement or acceptance by the Pan American Health Organization.

In 2005, the Republic of Peru had a population of 27,219,264 inhabitants. The country has a land area of 1,285,215 km², distributed over three major geographic regions: the coast, the Andean highlands, and the Amazon jungle. It is politically divided into 25 departments (including the Constitutional Province of El Callao) and encompasses 194 provinces and 1,829 districts.

GENERAL CONTEXT AND HEALTH DETERMINANTS

Social, Political, and Economic Determinants

Peru strengthened its democratic process during 2000–2005, maintaining its economic stability and substantially increasing the country's fiscal revenue: its international reserves rose from US\$ 8.8 billion to US\$ 13.8 billion, while the country's fiscal deficit decreased from 3.2% of the gross domestic product (GDP) to 1.0% during that same period. One transcendental aspect of Peru's situation is the vast inequality in living conditions and welfare among population groups, among regions, and between rural and urban areas. In general, nearly all welfare indicators show that rural areas, indigenous populations, females, the jungle region, and the central and southern highlands are at a disadvantage.

Since 2002, the GDP has grown by more than 4.0%, and it reached 6.7% in 2005. This increase has raised the per capita GDP to more than US\$ 2,000 per year (Figure 1). In 2005, Peru ranked 50 among the 180 member countries of the International Monetary Fund (in terms of the size of its economy, measured by GDP according to purchasing power parity) and was 97 in terms of per capita GDP (US\$ 5,983) (1), placing it in the category of “middle income” countries.

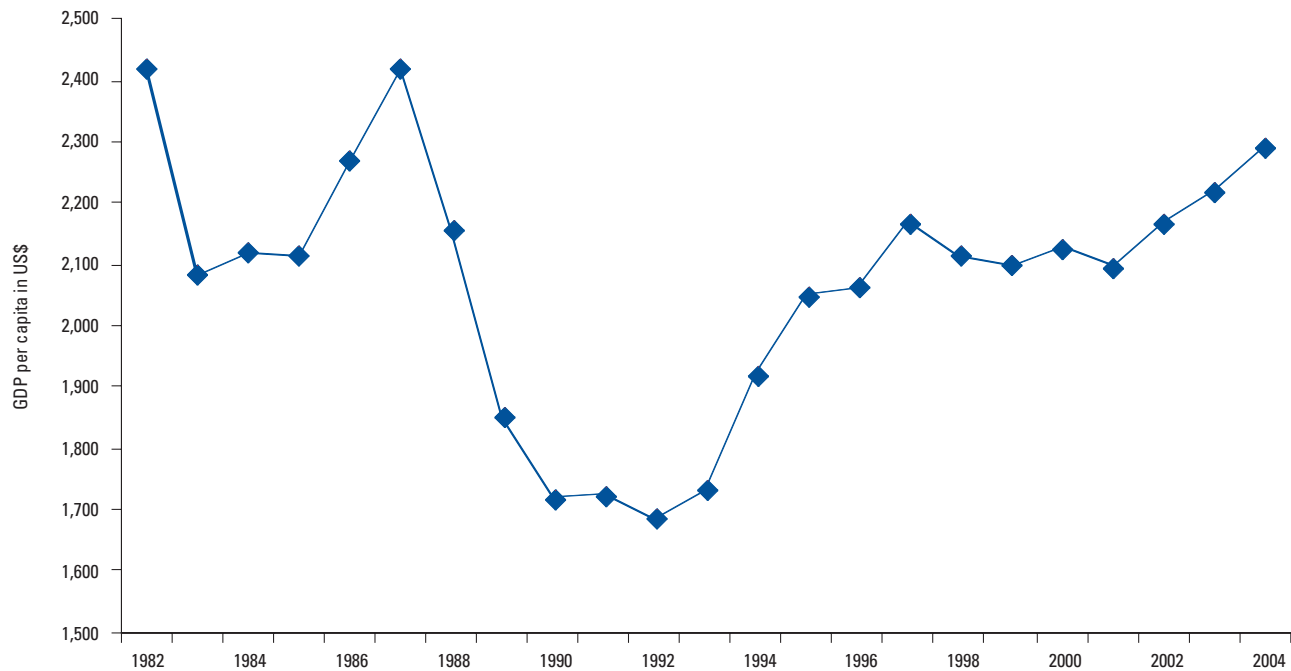
Very careful financial management in Peru has resulted in continually low inflation rates (3.7% in 2000, 0.1% in 2001, 2.0% in 2002, 2.5% in 2003, 3.5% in 2004, and 1.5% in 2005). In addition, in spite of low levels of confidence in Government (below 10% in mid-2005), private and foreign investment continued to grow (from 14.9% of the GDP in 2002 to 15.7% in 2005) (2); foreign investment largely went to the primary sector of the economy, particularly mining, which, in conjunction with construction, has been one of the largest growth areas of the economy. However, this sound economic performance with its perceptible macroeconomic results has not necessarily translated into improved living conditions for the majority of the population in terms reducing poverty, inequality, and exclusion. From 1997 onward, in a sustained fashion, external public debt has accounted for more than 30% of the GDP with a slight trend toward growth, and interest on the debt has totaled 2.0% of the GDP.

Income is highly concentrated in Peru: while the 20% of the population with the highest income received 47.5% of national income, the 20% of the population with the lowest income received only 6%. The unequal distribution of income, expressed as a ratio between the highest and lowest quintiles, rose from 4.9 to 7.9 between 1997 and 2000 (3). The Gini index for income distribution by population deciles was 0.51 for 2003 (4); that same year, the monthly average national household income was 387.8 *nuevos soles*, ranging from 628.6 in metropolitan Lima to 138.4 in Huánuco.

Total poverty increased from 48.4% in 2000 to 52.0% in 2004 and was greater in rural areas (73.6%). The percentage of people living in extreme poverty rose from 15.0% to 20.7% during that same period and was 42.5% in rural areas. In departments such as Huancavelica, poverty was 88.5% and extreme poverty 74.1% (4). These levels of poverty are similar to those recorded at the beginning of the 1990s.

The unemployment rate remained steady in urban areas at around 7.5% between 2001 and 2004. Unemployment increased during that same period in metropolitan Lima from 7.8% to 10.5%; underemployment also rose from 41.7% to 42.8% (5). A major labor phenomenon in Peru is the large proportion of the economically active population (55.0%) that works in the informal sector of the economy and that therefore has no access to social security, does not receive a steady income, and has no provisions for retirement. Both unemployment and underemployment are greater among women. In 2004, unemployment affected 9.4% of men and 12.0% of women, and underemployment 35.9% of men and 52.5% of women (5). One reason that unemployment and underemployment have remained high in spite of the sustained economic growth over the last five years is that growth has primarily occurred in sectors such as mining, which generate few employment posts.

In 2002, the National Agreement—which draws together the country's main political parties, churches, and business and worker organizations, as well as the Consultation Committee for the Fight against Poverty—defined 31 governmental policies that included goals related to the Millennium Development Goals (MDGs), regardless of whether direct reference was made to them. These objectives included reduction of poverty, promotion

FIGURE 1. Per capita gross domestic product, Peru, 1982–2004.

Source: Instituto Nacional de Estadística e Informática, Dirección Nacional de Cuentas Nacionales. Preliminary data for 2002 and 2003. 2004 data estimated by Instituto Cuánto.

of equal opportunities without discrimination, universal access to free quality public education, universal access to health services and social security, promotion of safe food and nutrition, sustainable development and environmental management, and development in infrastructure and housing. These are governmental policies, which the signing organizations have committed themselves to carrying out, and each has goals for the next 10 years.

In 2004, the Research Center of the Universidad del Pacífico in Lima created a model to predict fulfillment of the MDGs in Peru. According to this model, growth policies, redistribution policies, and specific social policies must be merged to meet the MDGs. With an annual average economic growth rate of 5%, fulfillment of the goals would require annual transfers of resources of close to 1.4% of the GDP (0.75% through income redistribution and 0.65% for specific social policies). The primary specific sectoral policies are to increase access to drinking water and basic sanitation services, coverage of health services for mothers and children under 5, investment in public complementary child feeding programs, the educational levels of mothers, the number of births in which care is provided by qualified health professionals, the number of prenatal exams by qualified health professionals, and the quality of the infrastructure and care received at health facilities. This would make it possible to meet all the objectives associated with the first five MDGs, with the exception of the prevalence of caloric deficit. That goal will not be reached even

with annual sustained economic growth rates of 7% because of its vast scope (32.5% during 2003–2004) (6).

In 2004, the illiteracy rate was 11.6%, with a wide gap between men and women (5.8% and 17.2%, respectively) as well as in poor areas with a high percentage of campesino and Quechua-speaking populations, such as Apurímac, Ayacucho, Cusco, and Huancavelica, where these percentages exceed 6% for men and 25% for women. Preschool attendance for children between 3 and 5 years old was 50%; primary school attendance among children between 6 and 11 years old was 90.5%, and secondary school attendance among 12- to 17-year-olds was to 67.6% (68.3% for men and 66.8% for women). The average number of years of study for the population 15 years and older was 9.1 years: 10.2 in urban areas and 6.5 in rural areas, and 9.3 among men and 8.9 among women (7). This is compounded by quality issues in state education establishments, which seriously limit the possibilities of the country's development and particularly that of the poorest populations (8). Investment in the education sector totals 16% of public spending.

Air quality is deficient in the metropolitan areas of Lima, Callao, and Arequipa and in the industrial urban centers of Chimbote, Ilo, and Cerro de Pasco, due to industrial development without adequate pollution control and the increase and poor maintenance of automobiles in circulation. Measurements taken in Lima and Callao in 2000 found an annual average concentration of total suspended particles greater than 200 $\mu\text{g}/\text{m}^3$; in ad-

dition, annual average concentrations of nitrogen dioxide, sulfur dioxide, and lead, measured in the center of Lima, surpassed WHO-recommended levels (9).

Peru is exposed to such natural disasters as earthquakes, volcanic activity, landslides, floods, droughts, tsunamis, and the El Niño phenomenon. It is also subject to accidents caused by humans, particularly fires and chemical spills.

Demographics, Mortality, and Morbidity

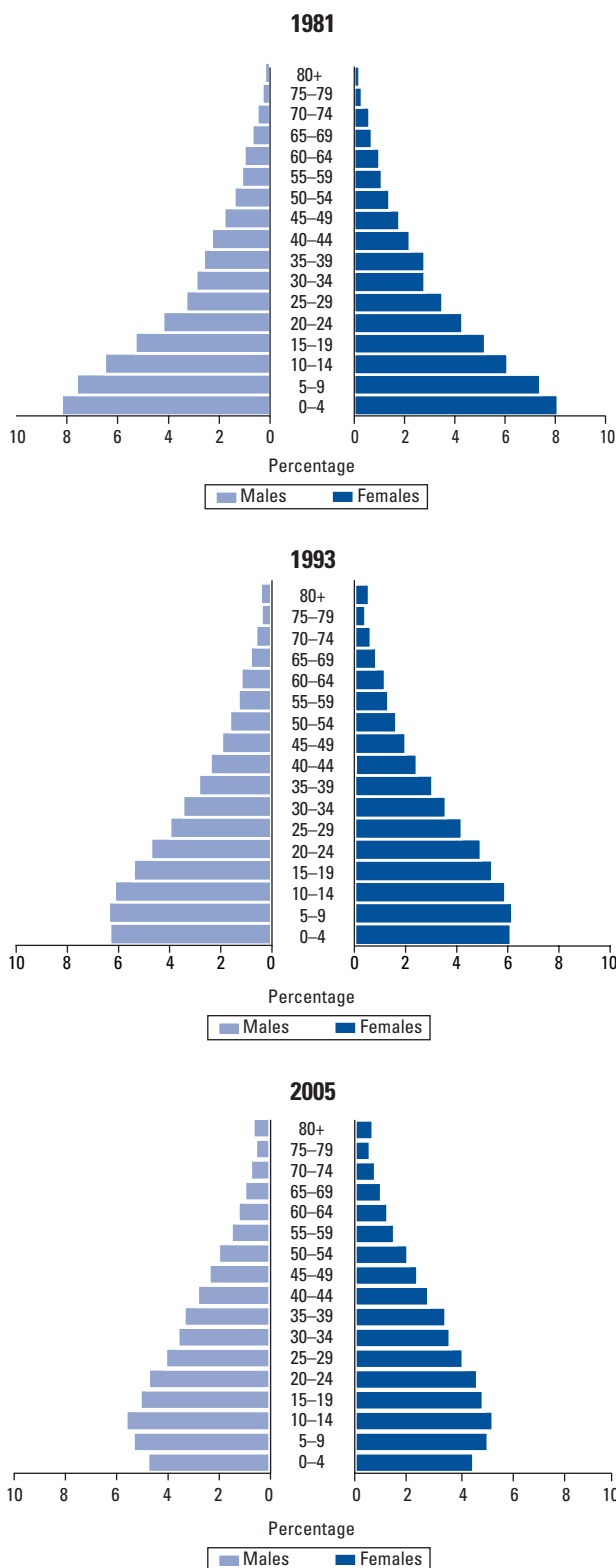
The population of Peru was 27,219,264 inhabitants in 2005 (10), and it is estimated to reach 30 million by 2010 (11). The Peruvian population has almost doubled over the last 30 years, even though the total growth rate has decreased from 23.8 per 1,000 inhabitants during 1980–1985 to 14.9 during 2000–2005. This has been the result of the reduction in the total fertility rate from 4.7 to 2.8 children per woman during this same period. During the 2000–2005 period, the birth rate was 23.3, and the mortality rate was 6.2 per 1,000 population. The decrease in overall and child mortality contributed to increased life expectancy at birth from 61.6 to 69.8 years during 1980–2005. During the 2000–2005 period, life expectancy at birth was 67.3 for men and 72.4 for women (11).

Between the censuses of 1993 and 2005, the percentage of people under 15 years of age decreased from 37.0% to 31.1%, even though the absolute numbers rose from 8,155,376 to 8,455,390. Those over the age of 65 went from 4.6% to 6.2% (1,026,119 to 1,693,657) (Figure 2).

Migration, both internal and external, is a major demographic phenomenon in the country and the result of industrialization, deteriorated living conditions in rural areas, and, during the 1980s, the internal war and the profound economic crisis that produced hyperinflation. The departments that traditionally lose population are located in the southern highlands (Huancavelica, Ayacucho, Apurímac, Cusco, and Puno); they are the poorest and have the highest percentage of rural population. In 2001, 37.6% of the population living in Lima were immigrants: 36.2% from Tacna, 28.4% from Arequipa (located on the coast and more industrialized), 38.2% from Madre de Dios, and 32.9% from Ucayali (both located in the Amazon jungle) (12). In terms of international migration, it is estimated that 141,000 people left Peru between 1975 and 1985 and that 370,000 left between 1990 and 1995. The improved economic situation and defeat of subversive groups at the beginning of the 1990s are reversing this trend, and it is estimated that the exodus of Peruvians dropped to 50,000 between 2000 and 2005 (11).

In 2005, 72.6% of the Peruvian population lived in urban areas. During 2000–2005, mortality and birth rates and the total fertility rate were higher in rural areas (7.9, 31.0, and 4.6 per 1,000, respectively) than in urban areas (5.5, 20.3, and 2.4) (11). While the reproductive growth rate is higher in rural areas than in urban areas (23.1 compared to 14.9 per 1,000 population), there is less total population growth (9.8 compared to 16.9) be-

FIGURE 2. Population structure, by age and sex, Peru, 1981, 1993, and 2005.



Source: Peru, Instituto Nacional de Estadística e Informática, Censos de Población y Vivienda.

TABLE 1. Leading causes of mortality, Peru, 2004.

	Causes of mortality (PAHO List 6/67)	Mortality rate per 100,000 population
1	Acute respiratory infections	68.0
2	Ischemic heart diseases	25.7
3	Cerebrovascular diseases	24.3
4	Septicemia, except for neonatal	21.5
5	Cirrhosis and certain other chronic liver diseases	21.4
6	Hypertensive diseases	16.9
7	Malignant stomach tumors	15.6
8	Respiratory disorders originating in the perinatal period	14.7
9	Tuberculosis	13.2
10	Diabetes mellitus	12.3

Source: Adapted from Peru, Ministerio de Salud, mortality database.

TABLE 2. Selected sociodemographic characteristics and mortality, Southern Highlands departments, Lima, and Callao, Peru.

	Peru	Southern Highlands	Lima and Callao
Poverty (%)	52.0	70.0	35.7
Rural population (%)	27.8	56.2	0.4
Quechua or Aymara as native language (%)	19.5	71.2	10.1
Public drinking water (%)	64.4	42.3	82.4
Elimination of excreta via a public system (%)	50.9	23.2	80.2
Population under 15 years of age (%)	31.1	36.3	26.0
Total percentage of the population	100.0	14.7	32.1
Mortality rate ^a	6.2	11.2	4.5
Mortality rate for communicable diseases ^a	124.6	228.9	91.3
Mortality rate for certain diseases originating in the perinatal period ^a	34.4	61.1	16.8
Mortality rate due to external causes ^a	66.1	158.2	30.5

^aRate per 100,000 population.

Source: Adapted from Peru, Ministerio de Salud, mortality database.

cause of internal migration. The percentage of the population under 15 years of age is greater in rural areas than in urban areas (39.9% and 29.4%), while the reverse is true for those over 64 years of age (4.7% and 5.4%, respectively).

During 2000–2005 there was a 7-year difference in life expectancy at birth between the urban and rural populations (73.2 and 66.9, respectively), due to higher mortality rates, particularly child mortality, in rural areas (24.2 per 100,000 urban and 49.2 per 100,000 rural).

With regard to the leading causes of death, it should be mentioned that there is a serious problem in the Peruvian health information system with regard to low coverage of death records (55% in 2004, of which 88% were certified by physicians). Between 1990 and 2000, there was a significant reduction in mortality¹ from communicable diseases, from 236.2 to 124.6 per

100,000; likewise mortality from certain diseases originating in the perinatal period decreased from 53.8 to 34.4, while deaths from neoplasms or tumors increased from 96.2 to 108.4, as did deaths from external causes (from 59.0 to 66.1). While chronic diseases predominated among the main causes of death in 2004, acute respiratory infections were the leading cause, and certain other communicable diseases had high mortality rates (Table 1).

Analysis of mortality by sex shows that acute respiratory infections were the leading cause of death for both males and females (71.3 and 64.7). Ischemic heart diseases had a higher mortality rate among men than women (29.7 and 21.7), as did cirrhosis and other chronic diseases of the liver (27.5 and 15.1), tuberculosis (17.1 and 9.2), and overland transportation accidents (15.1 and 5.5). Malignant uterine tumors (cervix, uterus, unspecified part) were the sixth leading cause of death among women (15.6 per 100,000), and malignant prostate tumors were the fourteenth leading cause of death among men (12.4 per 100,000).

Mortality profiles in Peru are very heterogeneous; departments in the southern highlands—with a high proportion of

¹Mortality rates for groups and subgroups from PAHO List 6/67 were obtained by using the estimation procedures described in *Health Statistics from the Americas, 1992 Edition*.

TABLE 3. Leading causes of death, Southern Highlands, Peru, 2000.

Causes of mortality (List 6/67 PAHO)		Mortality rate per 100,000 population
1	Acute respiratory infections	147.9
2	Cirrhosis and certain other chronic liver diseases	51.0
3	Cardiac insufficiency	46.5
4	Nutritional deficiencies and anemia	44.8
5	Appendicitis, hernia of the abdominal cavity, and intestinal obstruction	44.2
6	Cerebrovascular diseases	41.3
7	Respiratory disorders originating during the perinatal period	31.3
8	Septicemia, except for neonatal	26.2
9	Land transportation accidents	25.9
10	Malignant stomach tumors	25.0

Source: Adapted from Peru, Ministerio de Salud, mortality database.

TABLE 4. Leading Causes of Mortality in Lima and Callao, Peru, 2000.

Causes of mortality (List 6/67 PAHO)		Mortality rate per 100,000 population
1	Acute respiratory infections	41.0
2	Ischemic heart diseases	21.1
3	Cerebrovascular diseases	20.2
4	Tuberculosis	18.1
5	Malignant neoplasms of stomach	14.5
6	Hypertensive diseases	12.6
7	Diabetes mellitus	12.4
8	Cirrhosis and certain other chronic liver diseases	12.2
9	Septicemia, except for neonatal	11.8
10	Overland transportation accidents	10.1

Source: Adapted from Peru, Ministerio de Salud, mortality database.

people of Quechua or Aymara origin and high levels of poverty and rural areas, such as Apurímac, Ayacucho, Cusco, Huancavelica, and Puno—have higher mortality rates from communicable diseases, certain diseases originating in the perinatal period, and external causes compared with Lima and Callao—areas with greater industrial development, lower poverty rates, and better access to basic services (Table 2).

In 2000, the leading causes of death in Lima and Callao were chronic diseases, while in the southern highlands they were communicable diseases, nutritional deficiencies, and problems related to accessing health services (Tables 3 and 4). Acute respiratory infections were the leading cause of death in the southern highlands as well as in Lima and Callao, but to very different extents. The risk of dying from this cause was 3.6 times greater in the southern highlands. Transportation accidents in the southern highlands, the ninth leading cause of death, were generally due to the fall or overturn of interprovincial transportation vehicles carrying passengers, which occurs because of the poor state of roadways and of the vehicles.

It also bears mentioning that 20% of the poorest population accounted for 50% of deaths from nutritional deficiencies and anemia (Gini of 0.43); 40% of deaths from intestinal infectious

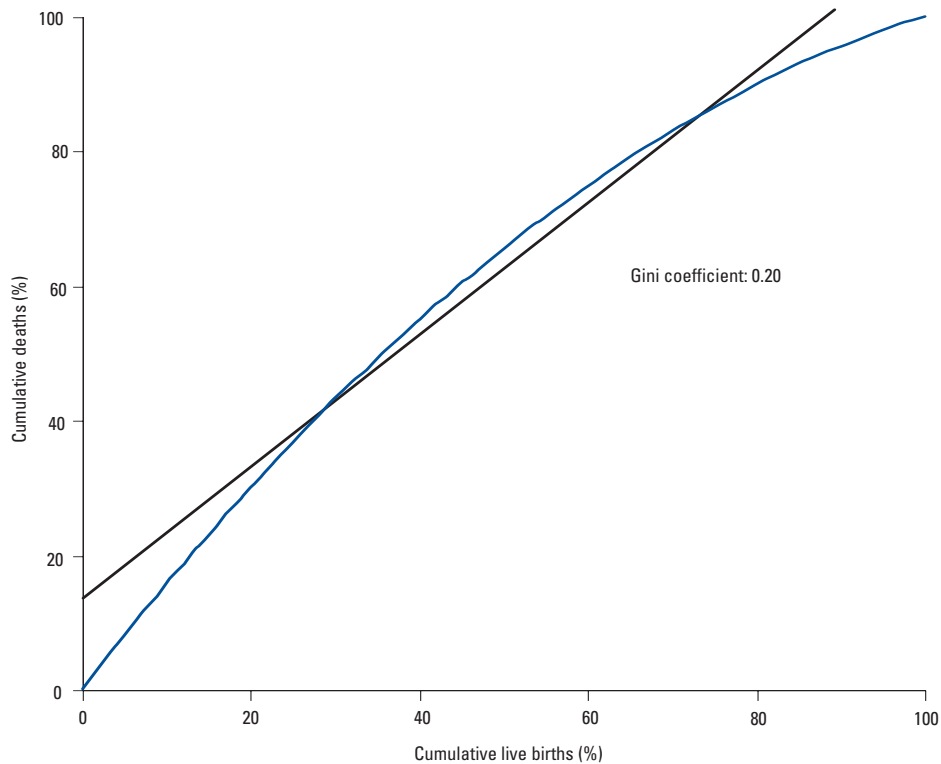
diseases (Gini of 0.38), and 62% from appendicitis, abdominal hernias, and intestinal obstruction with no mention of hernia (Gini of 0.57) as a result of unstable living conditions and limited access to quality health services.

HEALTH OF POPULATION GROUPS

Children under 5 Years Old

In 2005, children under 5 years old constituted 9.45% of the population (2,572,220). Chronic malnutrition is still high among this group, and there was no significant change between 1996 (25.8%) (13) and 2004 (24.1%), with a marked difference between urban and rural areas (10.1% and 39.0%, respectively) (14). In 2000, acute malnutrition affected 0.9% of children under 5 years old, although it was 3.0% in Ayacucho (15).

Infant mortality decreased from 33 per 1,000 live births in 2000 to 23 in 2005 (14,15), although there were broad differences among departments, from 84 in Cusco to 17 in metropolitan Lima (14), and a Gini index of 0.20 (Figure 3). There are also differences according to the mother's level of education (an indicator of the family's socioeconomic situation); in 2000, infant

FIGURE 3. Infant mortality, Peru, 2000.

Source: Peru, Instituto Nacional de Estadística e Informática; United Nations Development Program. *Human Development Report*. Peru 2002.

mortality among children of women with no schooling was 73, and 20 among those with higher education (14).

The child mortality rate decreased from 47 to 31 per 1,000 live births between 2000 and 2005 (14,15), but there were also vast differences among departments (108 in Cusco and 23 in metropolitan Lima) (15). The reduction in infant and child mortality was primarily due to the decrease in deaths from communicable diseases, from 2,467.5 per 100,000 children under 1 year in 1990 to 712.2 in 2004 (16). In 2004, the leading causes of death among children under 1 year old were respiratory diseases specific to the perinatal period (669.8 per 100,000 children under 1 year old); acute respiratory infections (448.3); delayed fetal growth, fetal malnutrition, short gestation, and low birthweight (402.1); and bacterial sepsis in newborns (287.0). The leading cause, respiratory diseases specific to the perinatal period, is related to low coverage of birthing care in health facilities and lack of immediate attention for the newborn, including resuscitation of children who are not responsive at birth (17); the third leading cause has its roots in maternal malnutrition (25.4% prevalence of anemia among women between 15 and 49 years of age) (15).

Exclusive breast-feeding is one of the main strategies that the Ministry of Health has been promoting in recent years. Accord-

ing to available data (14), 97.9% of children under 5 years old have been breast-fed at some point: 87.4% during the first day of life, although 27.4% received some type of feeding before breast-feeding. Exclusive breast-feeding in children under 6 months of age was 63.9%, and the average duration was 3.9 months.

Children 5–9 Years Old

Children between 5 and 9 years of age represent 10.6% of the Peruvian population. In 2004, the mortality rate for this group was 11.3 per 100,000; the leading causes of death were acute respiratory infections (12.2 per 100,000), undefined events (10.3), land transportation accidents (8.6), leukemia (6.3), and septicemia (5.8) (16).

Adolescents 10–14 Years Old and 15–19 Years Old

Adolescents 10 to 19 years old represent 21.2% of the total population. Among those between 10 and 14 years of age, external causes were the leading causes of death in 2004 (21.1 per 100,000), followed by communicable diseases (11.5). Death is greater in males than in females for acute respiratory infections (5.4 and 4.1, respectively), leukemia (4.3 and 3.0), land trans-

portation accidents (6.2 and 1.2), and drowning and accidental submersion (2.8 and 1.0) (16).

Among adolescents between 15 and 19 years of age, the mortality rate due to external causes was double that of communicable diseases and triple that of neoplasms (35.4, 15.1, and 11.7, respectively) in 2004. The five leading causes of death among males were undefined events (14.5), land transportation accidents (8.9), tuberculosis (6.5), acute respiratory infections (6.3), and accidental firing of firearms (5.4); among females, the leading causes were undefined events (5.3), acute respiratory infections (3.9), leukemia (2.9), accidental poisoning by (and exposure to) harmful substances (2.5), and land transportation accidents (2.4). Complications of pregnancy, birth, and puerperium (2.3) were the sixth leading cause of death among females in this age group (16).

In 2004, 12.7% of adolescent women were already mothers or were pregnant, a very similar situation to that in 2000 (13.0%), with a much higher percentage in rural areas than in urban areas (20.3% and 9.5%, respectively) and much higher among adolescents in the lowest income quintile (27.0%) than in the highest income quintile (3.3%) (14).

Adults 20–59 Years Old

This group makes up 50.1% of the Peruvian population (approximately 13.5 million people). The total fertility rate dropped from 2.9 children per woman during 1997–2000 to 2.4 during 2001–2004; during the latter period, the figures were 3.6 in rural areas and 2.0 in urban areas (14). The highest fertility rates were among women between 25 and 29 years of age (115 births per 1,000 women) and between 20 and 24 (113). The interval between pregnancies increased from 37 to 43 months between 2000 and 2004; the interval was lower for uneducated women (27 months) and higher for women with higher education (52 months). The age of initial procreation was higher in urban areas (23.3 years) than in rural areas (20.2) and higher still in metropolitan Lima (24.2).

In 2004, 98.5% of all women between 15 and 49 years of age in domestic partnerships had knowledge of some modern contraceptive method, but only 44.7% used any, which represented a slight decrease from 2000 (50.4%); in contrast, the use of traditional methods increased from 17.5% to 22.0% (14).

Maternal mortality decreased from 265 per 100,000 live births in 1996 to 185 in 2000 (13,15); however, during the latter year it exceeded 300 per 100,000 live births in departments such as Puno (361), Huancavelica (302), and Ayacucho (301), and it was less than 100 in Arequipa (96), Tacna (87), Lima (52), and Ica (48) (18). The leading causes of maternal death were postpartum hemorrhaging (33.4%), eclampsia (11.6%), complications of labor and delivery (10.7%), and abortion (6.2%).

In 2004, mortality from external causes was four times higher among men than women (101.8 and 24.2 per 100,000) and from

communicable diseases it was twice as high (80.3 and 39.1), while death from neoplasms was higher among women (83.8 and 57.3). The leading causes of death among adult men were cirrhosis and other chronic liver diseases (25.8), HIV/AIDS (24.9), acute respiratory infections (20.7), tuberculosis (19.7), and overland transportation accidents (18.2). Among women, the leading causes were malignant tumors of the uterus (17.9), acute respiratory infections (12.9), malignant breast tumors (11.5), cerebrovascular diseases (11.2), and tuberculosis (9.7) (16).

Older Adults 60 Years Old and Older

Of the total Peruvian population, 8.8% are 60 years old or older; in 2004, acute respiratory infections were the leading cause of death among men and women (555.1 and 530.1 per 100,000, respectively) in this group, and ischemic heart diseases ranked second (309.0 and 226.8). Among men, cerebrovascular diseases (237.5), cirrhosis and other chronic liver diseases (197.0), and hypertensive diseases (180.6) held third, fourth, and fifth places, while for women these were hypertensive diseases (181.1), septicemia (137.3), and malignant stomach tumors (130.1) (16).

The Family

In 2004, 57.8% of the total of families in the country were nuclear families, 23.6% were extended, 6.2% were blended, 7.6% were single person, and 4.8% were homes with no core structure. Women headed 21.1% of families, with a higher percentage in urban areas (23.9%) than in rural areas (16.0%) and a higher percentage in nonpoor homes (24.1%) than in poor ones (17.3%). The majority of single-parent families were headed by women (78.7%). Poverty levels in single-parent families were similar for men (39.2%) and women (39.8%), even though there was a significant difference in rural areas (59.9% and 67.0%) (7).

Workers

Between 1996 and 2001, the percentage of children and adolescents between 6 and 17 years old who worked increased from 20.8% to 28.6% (19, 20). In 2001, of the total of children between 6 and 17 years of age who worked, 54.0% were male, and 42.4% were between 6 and 11 years old. Working children between 6 and 13 years of age were concentrated in nontechnical activities and family businesses and received little or no remuneration. Among adolescents between 14 and 17 years old, 48.7% worked as manual laborers, 11.6% as vendors in kiosks and markets, 8.6% in domestic labor, and 7.0% were weavers, spinners, or mechanical assistants; 70% of working adolescents lived in rural areas. The Ministry of Labor and Employment Promotion developed the National Plan for Children and Adolescents; its goal is to eliminate the worst forms of child labor, including, among others, in small-scale mining (in which 50,000 children and ado-

lescents work), garbage picking, small-scale brick making, domestic labor in outside homes, gathering of coca leaves, and working in bars.

The main health problems facing workers were the lack of protection at work and low coverage for occupational health services. In 2003, social security covered 50.2% of all workers (66.3% from the formal sector, and 10.6% from micro-businesses—with up to five employees) (21). There is little information about work accidents and occupational illnesses, but according to social security reports, in 2002, there were 16,914 work accidents, 60% of them in Lima. The highest mortality from work accidents occurred in the mining industry, with 68 per 100,000 mining workers; it is followed by construction (58), transportation (37), and industry (14) (22).

Persons with Disabilities

There is little information about this population group, and available data differ a great deal. The 1993 Population Census found that people with some form of disability represented 1.3% of the total population. That same year, another study stated that 13.1% of the population had some form of handicap, 31.3% some disability, and 45.4% some impairment (23). The percentage of people with disabilities is higher in urban areas than in rural areas (36.3% and 16.4%, respectively). The primary disabilities included the side effects of poliomyelitis and the loss, or loss of use of, lower or upper extremities (28%); blindness (21%); deafness (14%); mental retardation (12%); mental disorders (10%); and muteness (7%). In 2005, according to the preliminary results of the Continuous Survey of the Population Census, 8.7% of the population had some form of disability, whether it was visual, verbal, auditory, motor, or cognitive; this percentage was greater in metropolitan Lima (10.9%) than in rural areas (8.0%) and other urban areas (7.6%) (24).

HEALTH CONDITIONS AND PROBLEMS

COMMUNICABLE DISEASES

Vector-borne Diseases

It is estimated that 13 million people live in areas at risk of **malaria** transmission (1.2 million in high-risk areas); in 2005, a total of 87,699 malaria cases were reported, a significant decrease from the 247,229 cases reported in 1998, although the El Niño phenomenon of 1997 and 1998 must be taken into consideration. Reported cases came from the Amazon jungle and the northern coast; the former is a very wet and rainy area nearly all year long, and the latter is a desert area, but with rice plantations that require large amounts of water, making them suitable places for the vector to reproduce. Seventeen percent of malaria cases were caused by *Plasmodium falciparum*. Mortality is low in Peru, and four deaths were reported in 2005.

In terms of **dengue**, there are 10 million people living in cities infested with *Aedes aegypti*; these cities are located on the northern coast and in the jungle. There are four dengue virus serotypes in Peru. There was an outbreak in 2001 on the northern coast, and 23,329 cases were reported, of which 250 were **hemorrhagic dengue**. In 2005, a total of 7,360 cases were reported, 926 of them confirmed; the same year there was an outbreak for the first time in the northern zone of the city of Lima (with 813 cases), which lasted from March to April. During that outbreak, serotype 3 was isolated, and entomological surveys found the vector in most of the districts in northern Lima and in two southern districts.

It was estimated that 1.5 million people live in areas at risk for the transmission of **Chagas' disease**, in the departments of Ica, Arequipa, Moquegua, and Tacna. Prevalence in blood banks in these areas was 0.8% in 2003. In the city of Arequipa, which has a population of approximately 1 million inhabitants, where the vector exists and the disease is transmitted, a plan is being implemented to eliminate *Triatoma infestans*, using funds from the Arequipa regional government and with international cooperation.

Leishmaniasis is widespread in the mountain and jungle areas of the country. In Peru, there are two clinical forms of leishmaniasis, cutaneous and the mucocutaneous; the latter is found only in the Amazon jungle. In 2005, a total of 7,127 cases were reported, 95.3% of which were cutaneous, and 4.7% of which were mucocutaneous; 70% of the reported cases originated in Amazonas, Madre de Dios, Cajamarca, and Cusco.

Between 2001 and 2005, there were 226 reported cases of **yellow fever** (30, 42, 12, 67, and 75, respectively). A massive universal vaccination campaign was initiated in 2004 in endemic departments and in those from which workers traveled to the jungle during seasonal harvest and planting; 90% coverage was achieved.

Vaccine-preventable Diseases

Morbidity and mortality from vaccine preventable diseases remained low during 2001–2005, due to high vaccination coverage obtained, in spite of the reduction between 2000 and 2004 in coverage for DPT3 (diphtheria, pertussis, tetanus) (from 98% to 91%), OPV3 (oral polio vaccine) (from 93% to 91%), BCG (bacillus Calmette–Guérin) (from 93% to 92%), and measles vaccine (from 97% to 86%) (25). In 2004, there were 1,580 reported cases of **whooping cough**, and 4 cases of **neonatal tetanus**; the last case of **measles** was confirmed in 2000. Peru has remained free of acute **poliomyelitis**, and neonatal tetanus has been eliminated as a public health problem. In 2004, in spite of high national coverage, there were still departments without optimal coverage. For example, Ucayali had coverage of 70.2% for DPT3, 69.4% for OPV3, and 86.2% for the measles vaccine.

The General Law on Vaccines was enacted in June 2003 and it states that vaccination activities are mandatory and that funds allocated for this purpose should be flexible. Peru has made the pentavalent vaccine universal for children under 1 year old; this

vaccine has been part of the vaccine scheme since 2004. There is also a proposal to include boosters with the DPT and measles-rubella vaccines in the vaccine scheme. An intense **rubella** outbreak occurred during 2005–2006 with more than 5,000 cases, as well as the presence of **congenital rubella syndrome** (CRS). In 2006, a massive vaccination campaign was initiated among men and women to eliminate rubella and congenital rubella syndrome.

Intestinal Infectious Diseases

There was a 15% rate of prevalence of **diarrhea** in children under 5 during the 2 weeks before the demographic and family health survey in 2000 as well as in 2004 (14,15). Although intestinal infectious diseases are not a leading cause of death at the national level (49.8 per 100,000 children under 5), they are in several departments in the Amazon jungle, such as Madre de Dios (202.6), Ucayali (153.7), and Amazonas (144.1), and in the poorest departments such as Puno (113.9) and Huancavelica (89.8); in Lima and Callao, rates are 11.5 and 9.8, respectively (16).

Chronic Communicable Diseases

In 2005, 30,226 new cases of **tuberculosis** (TB) were identified (109.7 per 100,000 inhabitants), representing a decrease from 2000 when 34,280 cases were identified (133.6 per 100,000 inhabitants). In 2005, 668 patients were diagnosed with TB/HIV coinfection (2.4 per 100,000 inhabitants); that same year the rate of relapse was 11.6%, and the percentage of failure to respond to first-line drugs was 2.8%.

Between 2001 and 2005, 8,561 cases of multidrug resistant tuberculosis (MDR TB) were diagnosed and treated. As of 2004, the cure rate was less than 40%, so beginning in 2005, new rules were established for caring for these patients, which incorporate a highly efficient drug regimen. This measure is expected to raise the cure rate to 85% in 2007, and, beginning in 2008, to reduce the annual MDR TB rate by 5%. During the last quarter of 2005, the third National Survey on Resistance of *Mycobacterium tuberculosis* was carried out; the second survey was completed in 1999 and found MDR TB in 3.0% of new cases and in 12.3% of people who had been treated previously.

In 2002, the prevalence of **leprosy** was 0.03 per 10,000 population. Eighty-three new cases were reported between 2003 and 2005 (34, 20, and 29, respectively). Of the 29 cases reported in 2005, 20 were multibacillary and 9 were paucibacillary; 2 were in children under 15, and 12 were in females. All cases originated in the jungle (Loreto and Ucayali).

Acute Respiratory Infections

These infections are one of the leading causes of morbidity and are the leading cause of death. In 2004, 17.0% of children under 5 had some episode of this disease during the 2 weeks before the survey; the percentage was higher among children in the poorest quintile (22%) than among those in the wealthiest (15%) (14). That same year, the mortality rate for the entire population was 68.0 per 100,000 population, but it was 7 times higher among

children under 1 year old (483.3) and 11 times higher among people over 64 years old (722.2). The highest mortality rates were observed in the poorest departments, such as Ucayali (298.4), Apurímac (290.4), and Puno (278.9), while rates were 82.5 in Lima and 69.3 in Tacna.

HIV/AIDS and Other Sexually Transmitted Infections

As of December 2005, a total of 18,117 cases of AIDS had been reported in Peru. It is estimated that there are 70,000 people with HIV, and 7,000 of them have progressed to the AIDS phase. The average age of the reported cases was 31 years. The ratio of men to women with AIDS has continuously and progressively declined from 13.3:1 in 1990 to 2.8:1 in 2005. In 97% of the cases, AIDS was transmitted sexually; transmission was vertical in 2% of the cases, and parenteral in 1% (26). In 2002, HIV seroprevalence among carriers between 15 and 24 years of age was 0.21% (27) and, depending on the study, HIV prevalence among men who have sex with other men varied from 11% to 18%. A population sample study was carried out in 2002 of those between 18 and 29 years of age, in 24 cities with more than 50,000 inhabitants, with the exceptions of Lima and Callao. The primary findings showed an HIV prevalence rate of 0.4% among men and 0.1% among women. Twelve percent of the men had had sex with other men. Twenty-four percent of men used a condom during their last casual sexual relation with a woman, and 32% did so during their last same-sex encounter. The prevalence of **syphilis** was similar among men and women (1.1%), and the prevalence of **chlamydia** was higher among women (4.0% and 6.8%, respectively), as was **gonorrhea** (0.3% and 0.8%) (28).

Peru obtained funding in 2003 from the Global Fund to Fight AIDS, Tuberculosis, and Malaria for the project Strengthening the Prevention and Control of AIDS and Tuberculosis in Peru. The majority of the funding for the HIV/AIDS component of the project was allocated to provide antiretroviral treatment. Before the project, fewer than 2,000 people received this treatment (the majority of them through social security). As of December 2005, treatment had been provided to 7,075 people. Starting in 2006, the Ministry of Health (MINSA) financed the purchase of antiretroviral treatments for people not affiliated with social security.

Zoonoses

There are active pockets of the **plague** in extremely poor areas, like the departments of Cajamarca, Piura, and Lambayeque. Two cases were reported in 2004, and five in 2005. Elimination of these pockets will depend on constructing and maintaining small-scale silos to store agricultural harvests and on improving housing and living conditions among the rural population, with the support of local governments.

Anthrax is endemic in several areas along Peru's coast, and its presence in humans is associated with handling infected animals. During 2003–2005, 136 cases were reported in the departments of Lima (65), Ica (43), Piura (18), and Tacna (10).

Human **brucellosis** is generally caused by consuming unpasteurized cheeses contaminated with *Brucella melitensis*. There were 5,397 cases diagnosed during 2002–2005 (2,450 in 2002, 1,358 in 2003, 1,108 in 2004, and 481 in 2005); the cities of Lima and Callao had the most cases. There is still no mechanism for learning the true magnitude of the problem nor how to control it, which must include the participation of goat ranchers, the milk industry, and consumers.

Since 2001, there had been no reported cases of human **rabies** transmitted by dog bites until 2005, when a human death was reported from this disease in the Department of Puno. There is a declining trend in canine rabies: in 2004, there were 24 cases, and in 2005, there were 22. The National Rabies Control Program bases this success on community education and information about the risk of contracting rabies, on timely and universally available access to preventative drugs before and after exposure, and to improved coverage of canine vaccination programs stemming from intensive vaccination campaigns from 25.5% in 2002 to 49.1% in 2004. On the other hand, outbreaks of wild rabies transmitted by vampire bats have been reported in indigenous communities in Amazonia: eight cases in 2004 (Amazonas) and seven in 2005 (four in Amazonas and three in Loreto).

Peru has made progress in controlling **foot-and-mouth disease** with the objective of eliminating it. Since October 2000, there had been no incidence of this disease, until 2004, when there was an outbreak caused by the type O virus. The outbreak was brought under control and the World Organization for Animal Health has certified 10 departments in southern Peru as being free of this disease. This will facilitate free trade of South American camelids and other agricultural products important to the rural economy and society.

NONCOMMUNICABLE DISEASES

Metabolic and Nutritional Diseases

The highest mortality rates from anemia and nutritional deficiency, in both the general population and among children under 5 years old, are in the country's poorest departments such as Huancavelica (72.5 per 100,000 inhabitants, and 168.8 per 100,000 children under 5, respectively), Huanuco (22.2 and 114.8), Ucayali (53.8 and 156.8), Puno (40.8 and 69.9), and Apurímac (31.9 and 45.2), while Lima had the lowest rates (4.9 and 9.4, respectively).

In 2004, 32.5% of the Peruvian population suffered from caloric deficit (28.6% of the urban population and 39.7% of the rural population). The poorest departments also had the highest percentages of people suffering from caloric deficit—for example, Huancavelica (63.5%), Huanuco (48.3%), and Puno (44.3%) (7).

In 2000, the percentage of children under 5 suffering from acute **malnutrition** was 0.9%, with the highest rate among children between 12 and 15 months of age (1.9%). That same year,

chronic malnutrition affected 25.4% of children under 5, and this rate was more than 30% after 16 months of age. The latter type of malnutrition affected boys and girls equally, although there was a significant difference according to area of residence: higher in rural areas (40.2%) than in urban areas (13.4%). Since this problem is associated with poverty, departments such as Huancavelica, Cusco, and Apurímac, where more than 70% of the population lives in poverty, had prevalence rates much higher than the national average (53.4%, 43.2%, and 43.0%, respectively) (15); the correlation coefficient between chronic malnutrition and poverty is 0.92 (Figure 4).

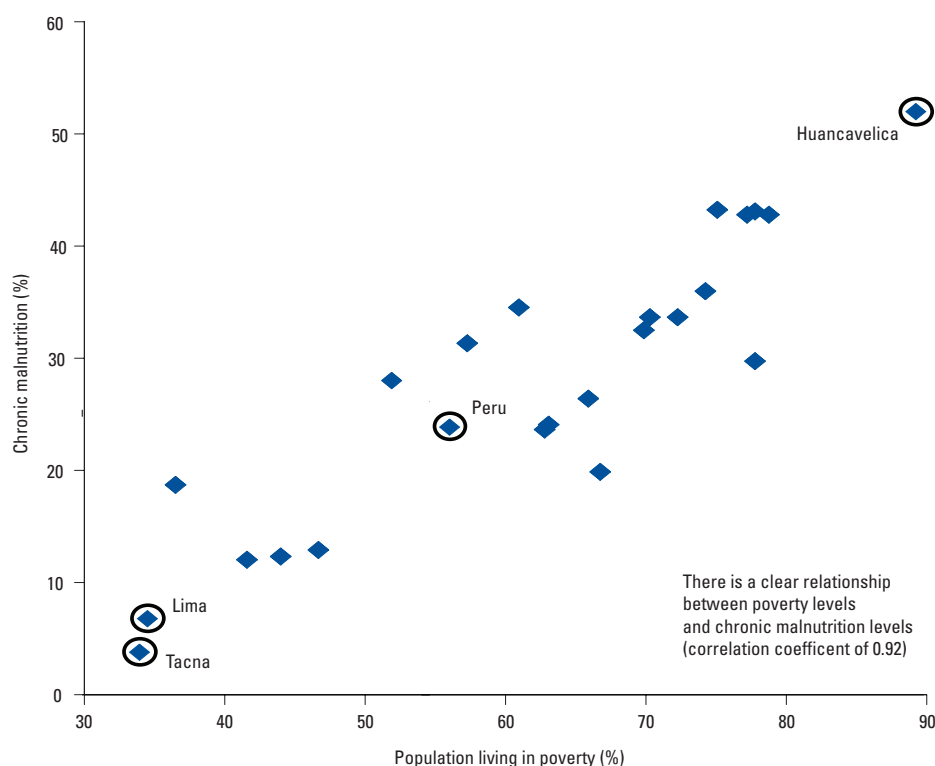
In 2000, the prevalence of iron-deficient **anemia** among women between 15 and 49 years of age was 31.6%, with 37.0% in rural areas and 29.2% in urban areas. By department, figures ranged from 45.9% in Ayacucho to 16.9% in Lima. Among children under 5 years of age, 49.6% had some form of anemia; the percentage was higher in rural areas than in urban ones (53.4% and 46.6%, respectively); at the same time, anemia affected 70.7% of children under 5 years old in Cusco and 61.5% in Puno (15). To decrease this problem, as well as deficiencies of other micronutrients, a high-level decree was issued in 2005, stating that wheat must contain iron (55 mg/kg), niacin (48 mg/kg), folic acid (1.2 mg/kg), vitamin B1 (5 mg/kg), and vitamin B2 (4 mg/kg).

A policy was begun in 1986 geared toward eliminating **iodine deficiency**, by promoting universal consumption of iodized salt, particularly in the mountains and jungle areas where the deficiency existed. In 1998, it was declared that iodine deficiency as a public health problem was eliminated. Since then, there has been continued monitoring of the consumption of iodized salt. A survey carried out in 2003 (29) found that the consumption of iodized salt at the national level was appropriate for 92.9% of children between 12 and 35 months of age and for 92.8% of women between 15 and 49 years of age; prevalence was lower in Loreto (86.2% and 85.0%, respectively), which is located in the Amazon jungle.

Assessments carried out between 1997 and 2001 by the National Health Institute found high levels of **vitamin A deficiency** in children under 5 years old. At the national level, this deficiency decreased from 19.2% to 13.0% during this period. In 2001, vitamin A deficiency was more prevalent in the southern highlands (22.9%) and the jungle (17.9%), while it was 10.3% in Lima. That same year, 8.7% of women between 15 and 49 years of age were affected by vitamin A deficiency; this rate was somewhat higher in the southern highlands (11.2%) (30). In 1996, the Ministry of Health set up a program for preventative vitamin A supplementation for babies and children between 6 and 59 months of age as well as for improved complementary feeding practices after 6 months of age for children and during gestation, focusing actions on the poorest provinces in Peru.

In 2000, the prevalence of **overweight** in mothers between 15 and 49 years of age was 33.7% and the prevalence of **obesity** was 13.0% (15). Among adults, the prevalence of overweight was up

FIGURE 4. Chronic malnutrition in children under 5 years of age, by levels of poverty, Peru, 2000.



Source: Perú, Instituto Nacional de Estadística e Informática. Encuesta Demográfica y de Salud Familiar 2000. Encuesta Nacional de Hogares 2001.

to 40%, and up to 20% for obesity (31, 32, 33). The prevalence of high cholesterol among adults varied according to the area under study, ranging from 47.2% in the district of Castilla (Piura) to 10.6% in Huaraz (Ancash) (32).

In Peru, **diabetes mellitus** was the fifteenth leading cause of death in 2000 and the tenth leading cause in 2004, the same year when it was the sixth leading cause of death for people between 45 and 64 years of age. In 2000, there was a 7.0% rate of prevalence of diabetes mellitus in the city of Lima, 6.7% in Piura, 4.4% in Tarapoto, and 1.3% in Huaraz (34). Although there are not many studies on the economic impact of this disease, a study carried out by Cayetano Heredia National Hospital in Lima found that the cost for the initial diagnosis and evaluation of a patient with diabetes mellitus varied between US\$ 120 and US\$ 200. When the patient had complications because of chronic renal insufficiency, the cost could rise to between US\$ 8,000 and US\$ 12,000 per year (34). In Lima, diabetes mellitus was responsible for 10% of the cases of chronic renal insufficiency (35).

Cardiovascular Diseases

In 2004, **ischemic heart disease** was the second leading cause of death in Peru (25.7 per 100,000 inhabitants) and was more

common among men (29.7) than women (21.7). The mortality rate for people between 45 and 64 years of age was 41.4 per 100,000 inhabitants (58.1 for men and 24.9 for women), and it was 352.1 among those over 65 years old (405.3 in men and 306.1 in women in this age group). **Hypertensive diseases** had a mortality rate of 16.9 per 100,000, less than that of ischemic heart disease and **cerebrovascular diseases** (24.3 per 100,000 inhabitants), although arterial hypertension is a problem associated with the other two. Studies carried out between 1997 and 2001 found a prevalence of between 15% and 20% of arterial hypertension in men and around 10% in women among certain select population groups (31, 32).

Malignant Neoplasms

In 2004, malignant stomach tumors were the seventh leading cause of death from all causes (PAHO List 6/67), with a mortality rate of 15.6 per 100,000 inhabitants; there was no difference between men and women. After stomach cancer, malignant prostate tumors were the second leading cancer among men (mortality rate of 12.4 per 100,000), even though after the age of 65 it surpassed stomach cancer as a cause of death (228.9 and 205.0, respectively). That same year malignant tumors of the uterus

(cervix, uterus, and unspecified part) were the sixth leading cause of death from all causes among women (15.6 per 100,000 women) and the first leading cause of death among women between 25 and 44 years of age (48.6 per 100,000). In spite of the importance of this type of cancer as a cause of morbidity and mortality, the Ministry of Health does not have a program in charge of its prevention and control. However, in 2004, the General Office of Human Health and the Specialized Institute for Neoplastic Diseases drafted the Rules and Procedures Manual for the prevention of cervical cancer to improve coverage for Pap smears and reduce morbidity and mortality levels.

OTHER HEALTH PROBLEMS OR ISSUES

Disasters

In recent decades, there have been three types of natural disasters: floods and the overflow of rivers in the north as a result of the El Niño phenomenon, earthquakes in the south and east, and flooding in the mountains during periods of intense rain. In the north of the country, where there is usually little rain, the El Niño phenomenon appears at irregular intervals, every 2 to 7 years, with increased precipitation and overflowing rivers. This affects agriculture and drinking water and sewage systems and increases the presence of vectors that significantly affect public health, including those that transmit malaria. One of the last two major earthquakes was in Arequipa, Moquegua, and Tacna (on June 23, 2001, a 6.9 magnitude on the Richter scale). There were 83 deaths, 219,420 injuries, and 22,052 homes destroyed. The second was in San Martín (on September 25, 2005, a 7.5 magnitude), but it did not cause major damage because its epicenter was far from urban centers with high concentrations of population (36).

Mental Health

In Lima, in 2002, 56.7% of the adult population thought that the main problem facing Peru was unemployment; poverty, 16.4%; corruption, 5.1%; and violence, 2.8%. This situation created a state of disillusionment (26.6%), bitterness and rage (25.9%), resignation (5.3%), and indifference (3.3%); moreover, 76.9% did not feel protected by the State. High levels of stress affected 49.5% of women and 41.6% of men. In terms of feelings of dissatisfaction, 40.6% related it to economic concerns, 29.5% to their upbringing, and 29.5% to their social relationships (37). Among this same population, the prevalence of lifetime anxiety was 20.3% among men and 30.1% among women and that of any psychiatric disorder was 32.9% for men and 41.5% for women. Among the adults interviewed, 30.3% had thought about killing themselves at one point, and 5.2% had tried it. The main reasons were problems in romantic relationships (45.1%) and economic problems (15.5%). The prevalence of psychotic disorders was 1.0% (0.7% in men and 1.3% in women). Also in 2002, among adolescents in Lima, 1 of every 7 had thoughts of suicide; the

prevalence of depressive disorders was 14.5% for males and 23.3% for females, and 1 of every 12 adolescents showed signs of depression (37).

Addictions

In 2002, the prevalence of alcohol and tobacco consumption at some point during their lives was 94.2% and 68.0%, respectively, for those between 12 and 64 years of age. The annual prevalence of alcohol consumption was 75.1% and was greater among men than women (79.8% and 71.0%); prevalence of tobacco use was 37.5% (53.3% for men and 23.7% for women). Among 12- and 13-year-old children, 36.0% had consumed alcohol during the year prior to the survey (42.6% of males and 28.4% of females) and 4.4% had used tobacco (6.8% of males and 1.6% of females). The average for initial consumption of alcohol was 13.7 years for the 12- to 19-year-old age group, 16.1 for the 20- to 29-year-old age group, and 17.4 for the 30- to 39-year-old age group. This difference shows that initial alcohol consumption has been taking place at a younger age in recent years.

The lifetime prevalence of illegal drug use was 5.8% for marijuana, 2.1% for basic cocaine paste, and 1.8% for cocaine hydrochloride. Among adolescents between 12 and 19 years of age, 5.2% had used marijuana, 1.1% basic cocaine paste, and 2.0% cocaine hydrochloride.

Alcohol dependence among 12- to 64-year-olds was 10.6% (17.8% among males and 4.3% among females), with higher rates among the group between 20 and 30 years of age (14.5%) and among those 31 to 40 years of age (13.4%). Tobacco was the second most common dependency at 4.4% (6.3% among males and 2.2% among females), with a higher rate among those between 20 and 30 years of age (6.8%) and those between 31 and 40 years of age (4.9%) (38).

Environmental Pollution

The National Agricultural Health Service has prohibited the registry, importation, local formulation, distribution, and marketing of the chloride pesticides aldrin, endrin, dieldrin, chlordane, mirex, heptachlor, and toxaphene. In 1991, all use of DDT and its derivatives was prohibited; the Ministry of Health does not use DDT in controlling malaria vectors. In 2003, symptoms of chronic pesticide poisoning were found in 1 of every 6 farmers in the provinces of Huancayo, Jaén, and Tarapoto (39). In addition, there is no program for farmers that would enable them to store and appropriately handle pesticides in rural areas; this has led to several instances of massive poisoning, such as the poisoning of 50 children with parathion (24 of whom died) in the community of Taucamarca (Cusco) in 1999 and the poisoning and subsequent death of 2 adults and 4 children in the district of Andarapa (Apurímac) in October 2003.

In 2002, an inventory was taken of the sources of the emission of dioxins and furans, and, in the city of Lima, dioxin levels of 21 ng/g were found (normal readings are 0.0072 to 14 ng/g, ac-

ording to WHO-TEQ). The primary sources of emissions are the incineration of municipal waste and hospital waste, the production of cement and metals, the generation of electricity, motorized vehicles, and paper pulp factories.

Oral Health

In 2001, the last year a national evaluation was carried out, the prevalence of dental caries among students between 6 and 15 years of age was 90.7%, and fluorosis was 35.7%. The DMFT (decayed, missing, filled teeth) index was 5.7, and it fluctuated between 8.3 in Ayacucho and 3.5 in Ancash. The DMFT index was 3.9 among 12-year-old children. Oral diseases were the second leading cause for medical visits to Ministry of Health facilities and represented more than 10% of all visits in 2004. Of the total of dental visits, 20.6% were for tooth extractions, and 18% were for fillings. In spite of the high demand for dental services, only 16% of all health facilities of the Ministry of Health provide these services, and the number of dentists working in them has not increased in recent years (1,681 in 2002 and 1,607 in 2004). However, with Comprehensive Health Insurance, it is hoped that access to basic oral health care will be improved for the poor, for dispersed populations, for children, and for pregnant women, who do not have social protection in health. As part of prevention activities, the National Technical Standard on Salt for Human Consumption has been reformulated and incorporates imported salt and increases the concentration of fluoride. On the coast, more than 80% of the urban population consumes iodized and fluoridated salt, but in the mountains and jungle, this figure is only 60% (40).

RESPONSE OF THE HEALTH SECTOR

Health Policies and Plans

In July 2001, the Peruvian Government called upon political parties and a group of political, religious, and civil society organizations to achieve a national consensus that would act as the basis for the transition and consolidation of democracy, affirmation of national identity, and development of a shared vision for the country's future. Of the 29 government policies approved, the 13th highlights the commitment to universal access to health services and social security, while the 15th is related to the promotion of food safety and nutrition.

The Sectoral Policy Guidelines for 2002–2012 guide the actions of the health sector and define the basis for modernization of the sector. The nine defined guidelines emphasize health promotion, comprehensive health care, universal insurance, financing for the poorest, and modernization of the Ministry of Health. Their strategic objectives include health promotion, prevention of chronic and degenerative diseases, health education, development of Comprehensive Health Insurance, reduction of child and maternal morbidity and mortality, expanded access to and rational use of drugs, and sectoral decentralization.

In 2002, the Basic Decentralization Law (Law No. 27783) was promulgated. It regulates the structure and organization of the State in the national, regional, and local spheres; defines rules that regulate administrative, economic, productive, financial, tax, and fiscal decentralization; assigns responsibilities for the three levels of government and determines the goods and resources for regional and local governments; and regulates government relations at its different levels. In January 2003, regional governments began operating with the functions and responsibilities, as well as budget management, that had been transferred to them.

In 2005, the Ministry of Health began the transfer process from health offices to regional governments² by means of an accreditation process carried out by the National Decentralization Council. This process involves the development of capacities in the regions to lead, direct, and manage health services following the transfer of certain responsibilities agreed upon with the National Decentralization Council. Although this process is due to be completed in 2010, extraordinary progress was made between 2004 and 2005, meaning that the goal of transferring responsibilities could be achieved sooner than planned. Several regions (La Libertad, Lambayeque, and Arequipa) have used participatory and consultation processes to establish regional health priorities, policies, and plans.

The Coordinated and Decentralized National Health System was created in 2001 as a mechanism for sectoral articulation among public subsectors (which include the Ministry of Health and the health services of the armed forces and national police) as well as private and social security subsectors. The first evaluation of the Coordinated and Decentralized National Health System was carried out in 2005 and showed that several adjustments were needed; since the Ministry of Health did not take on the leadership role for the Coordinated and Decentralized National Health System, primarily because it has neither the structure nor the competencies needed, it also became clear that the rules governing the agencies that comprise the Coordinated and Decentralized National Health System needed to be harmonized, so that these agencies could interact under the guidance of the Ministry and be compatible to operate as a coordinated system. The major progress observed in the Coordinated and Decentralized National Health System was the decentralization process in which the Ministry of Health played a key role.

The impact of decentralization on the public health sector is still in its initial phases, because the process of transferring functions, competencies, responsibilities, and resources is progressive by stages and by areas, as per the timeline agreed upon by the national government and regional governments. The main changes have been in the provision of public health services, which have been transferred to regional governments, and in the transfer of certain public health and health promotion activities, such as basic sanitation, to local governments.

²One for each department, with the exception of Lima, where the metropolitan area constitutes one region, and the rest of its provinces another.

As of June 2006, 34 competencies and responsibilities have been transferred to 24 of the 26 regional governments, which have shown that they have the ability to exercise decentralized functions. This makes them responsible for providing all of the health services, including negotiating finances, which are carried out through management contracts and results indicators. Between 2005 and 2006, all regional governments were evaluated using the measurement instrument known as the Essential Public Health Functions, which made it possible to learn about the level of performance for each regional government in terms of the Essential Public Health Functions as well as about existing gaps and needs. The central government will carry out a program to develop capacities based on the results of this evaluation.

Health Strategies and Programs

In 2004, 63.2% of the Peruvian population had no medical insurance (70.1% of the poor and 56.1% of the nonpoor were in this situation) (41). The main restriction on access to health services was economic: 32.1% of the poor with symptoms of diseases or who had accidents and thought medical treatment was necessary did not seek it out for this reason. As a strategy to improve access for the poor, the Comprehensive Health Insurance was created in 2001 from the merger of an insurance program for schoolchildren (created in 1977) and a maternal and child health insurance program (created in 1998). The Comprehensive Health Insurance covers those under 18 years of age, pregnant women, and certain groups of adults living in poverty. According to Comprehensive Health Insurance data, in 2004, there were 8.8 million members (32.0% of the total population). The National Household Survey stated that 20.1% of the entire population was affiliated with this medical insurance. In spite of the discrepancy in these numbers, this strategy has improved the population's access to health services, even though 40% of the population is still excluded from health services in some way, and 10% (2.7 million people) is completely excluded from the health system. Factors such as poverty, living in a rural area, and social and ethnic discrimination explain some of this situation, although internal problems of the health system are also important factors, including deficient provision of essential services in the poorest areas (42). For example, in 2000, preventable death from problems related to low-complexity surgery (mortality from appendicitis, abdominal hernia, and intestinal obstruction without hernia) was 1.7 per 100,000 population in Lima, while in the poorest departments in Peru, like Apurímac and Huancavelica, it was 30 times higher (62.1 and 59.0, respectively) (16).

The trend is to continue progressively toward universal insurance. Comprehensive Health Insurance is the public insurer for the poor and extremely poor, as well as for the population working in the informal sector. The social security system (ESSALUD) would insure the salaried population, leaving complementary plans and insurance open to the private sector for those who prefer them.

After deactivation of the National Health Programs in 2001, in July 2004, the Ministry of Health established 10 national health strategies, which are related to the health priorities and are the areas the Ministry of Health will promote and target in coming years: immunizations, prevention and control of metaxenic diseases and other diseases transmitted by vectors, prevention and control of sexually transmitted infections and HIV/ AIDS, prevention and control of tuberculosis, sexual and reproductive health, prevention and control of noncommunicable injuries, road safety, health of indigenous peoples, healthy food and nutrition, mental health, and a culture of peace.

Organization of the Health System

Peru's health system is segmented and has various actors in both services provision and public insurance, which carry out different but not necessarily complementary functions and with high degrees of overlap. This situation could become more marked with decentralization of the Peruvian government. The health system comprises ESSALUD (medical insurance and insurance for workplace risks and occupational health) which is public in nature and mandatory for salaried workers (in 2004, it covered 17.6% of the total population) (41); the Ministry of Health (with decentralized public national institutions: ophthalmology, cancer, rehabilitation, and pediatrics, among others); regional governments (to which were recently transferred functions and human and financial resources to provide public services) and local governments (to which responsibilities are being transferred in the areas of water and basic sanitation); the health services of the armed forces and the police (which cover approximately 3% of the population); and the nonprofit and for-profit private sector (with 10% coverage), of which the latter is extremely fragmented. Comprehensive Health Insurance is a public insurer and financier, which facilitates free access to basic health care for poor and extremely poor pregnant women and minors under the age of 18. There is also Mandatory Traffic Accident Insurance which covers care for injuries caused by this type of event.

There are also regulatory and research institutions, such as the National Health Institute (public health and health research laboratories), the Human Resources Institute for Health, and the Superintendence for Private Insurance, among others. Public services and those of ESSALUD are organized into geographically distributed care networks and by levels of complexity for the member population. They have general and basic hospitals and health centers and posts, most of which are categorized and regulated and which include a group of volunteer community agents that incorporates health promoters and midwives. The public sector and ESSALUD are based on the conceptual framework and criteria of the primary health care strategy.

To provide care to the poor and disperse populations living in the most distant rural areas of the mountains and the indigenous

population in Amazonia, the regional governments and the Ministry of Health have organized mobile care units, supported by Comprehensive Health Insurance, that provide care at regular intervals to this population and offer a package of basic or essential services as well as promotional and community organization actions. This service covers approximately 200,000 people.

Public Health Services

The Ministry of Health established the application of the primary care strategy as one of its national priorities for 2006–2012, and, as a result, has developed a set of actions, including implementation of the Comprehensive Health Care Model, which lists the health services to which a person is entitled to according to his or her life stage, and of the National Sanitary Strategies (as a replacement for the former Health Programs), social participation, development of rules for the organization of networks and categorization of health facilities, cultural adaptation of services, the gender focus, intersectoral action, and elimination of social exclusion in health through progressive implementation of universal insurance. In this context, the Comprehensive Health Care Model has defined and is implementing a set of basic actions according to life cycle or stage (vaccination, complementary feeding, a reproductive health package, and a promotional preventative package for adolescents, older adults, the family, and the community, etc.), which includes promotional, curative, and rehabilitative care for individuals, families, and communities. Collective care is the responsibility of regional and local governments, while individuals are the responsibility of care networks.

National Health Strategies are units for health analysis, surveillance, evaluation, programming, planning, and intelligence and are responsible for overseeing the control of specific high-impact or high-risk problems such as vaccine-preventable diseases, TB, malaria, maternal and child mortality, and the health of indigenous populations, among others.

In 2004, 64.4% of homes received water from the public system. Coverage for this service was greater in nonpoor homes (77.4%) than in poor homes (47.7%). Eighteen percent of all homes, 28.3% of the poor, and 46% of the rural population received water from rivers, streams, springs, or similar sources (7). This deficit was even greater in sewerage services: only 50.9% of homes were connected to the public network; 26.8% had latrines, blind wells, or septic tanks; and 22.3% had no system for excreta disposal. The latter figure was 52% in rural areas. Among indigenous populations in Amazonia, only 11.7% have some type of water supply system, mainly wells and public cisterns. Disinfection of water is practically nonexistent in nearly all these communities, and, in those where it does exist, it is done intermittently. Only 9.7% had some system for elimination of excreta, mainly latrines.

In 2004, only 23.4% of wastewater was treated in some way (primarily in the city of Lima) before final disposal (43), which

represents a serious environmental pollution problem. Another major source of water pollution is industrial activity, particularly mining. Monitoring of water quality has found that the majority of hydrographic basins are polluted by metals, including lead, arsenic, and cadmium (44). In some areas, the bioconcentration of metals is several times above the standards for food quality, as in the case of mercury in the fish sold in the public markets of Puerto Maldonado.

Solid waste collection reaches 73.7% of the population, and only 65.7% of this waste (8,532 tons per day) receives some form of final disposal: 14.7% is recycled, 29.8% (2,545 tons per day) is dumped in the environment (rivers and beaches are the main locations), and the rest is placed in landfills. This situation causes serious environmental pollution, which poses major risks to the stability of ecosystems and human health. Only certain hospitals in Lima have waste treatment systems. The Ministry of Health, through the General Office of Environmental Health has set up an environmental and health monitoring system for handling solid wastes at the national level, emphasizing final disposal and coverage of services, and already has a property register of all the systems currently operating. In addition, actions have been implemented to eliminate the clandestine treatment of solid wastes, especially those to be fed to swine and other livestock.

In terms of food safety, caloric availability in 1998 was 2,584 calories per capita per day. Cereals (wheat and rice) were the main source of energy and protein; 30% of wheat used in Peru is imported. Only 7% of all hydrobiological resources extracted are destined for direct human consumption and provide 10% of the total protein consumed by the Peruvian population.

In terms of preparation for a possible influenza pandemic, in October 2005, the Ministry of Health and the Ministry of Agriculture, with the support of PAHO and the Communicable Diseases Commission of the Coordinated and Decentralized National Health Council drafted the National Plan on Preparedness and Response to a Potential Influenza Pandemic; the objective of the plan is to facilitate an effective and coordinated national response to a potential influenza pandemic, providing recommendations to support health services and other institutions in preparing their own contingency plans. The plan includes vaccination against seasonal influenza for vulnerable groups (primarily the elderly and children) and health personnel: chemoprophylaxis with antivirals for 20,000 people for 6 weeks, treatment with antivirals for 100,000 people for 5 days, purchase of 2 million personal protection items, and the purchase of 100 ventilators. The cost of these activities is estimated at US\$ 47,185,000 (45).

Individual Care Services

At ESSALUD, individual care services are provided according to a specific organizational schematic for each subsector. In the public sector, it is carried out via care networks comprising

facilities of varying complexity, coordinated by levels of care interwoven through a system of references and counter-references; the point of entry into the system is general or comprehensive care practitioners or facilities with a lower level of complexity, and a national standardized clinical history is used, with mandatory content but free format. In public services, the basic health care of the Comprehensive Health Care Model or of the National Health Strategies is prioritized, and the user must pay a regulated and subsidized tariff (except for maternal and child care under Comprehensive Health Insurance).

The Peruvian health system provides nearly all types of routine and most frequently needed medical and technological care, but ESSALUD has greater technological development and routinely carries out kidney, marrow, and liver transplants. In all regions, there are intensive and perinatal care units with varying levels of functionality and equipment. The country has all clinical specialties and highly complex equipment, but they are not equitably distributed because they are concentrated in the main cities of Peru.

The National Center of Public Health Libraries is the regulatory technical body of the National Health Institute, in charge of researching, regulating, developing, and evaluating, from a comprehensive view, research into the development of new technology related to communicable and noncommunicable diseases. This Center is the reference laboratory for the 19 regional public health laboratories of the country.

In 2003, there were 92 blood banks in Peru, with the majority located in Lima, Callao, and the main cities; 93.3% of the blood units collected were through recovery, and only 5.3% were obtained from voluntary donors. More than 96% of the units were tested for the major blood-borne diseases; in 2003, there was a 0.27% prevalence of HIV, 0.62% for hepatitis B surface antigen, 0.55% for hepatitis C virus, 1.58% for syphilis, and 0.84% for *Trypanosoma cruzi*. However, there is no regulation, monitoring, and evaluation system to guarantee the quality of transfused blood, nor are there networks of blood banks or specialized units for their centralized management. In July 2006, the Ministry of Health approved the Policy Guidelines for the National Hemotherapy and Blood Banks Program, with a view toward creating the foundation for the National Network and Regional Networks of Transfusion Services, as well as guaranteeing the quality and safety of blood for transfusion in health facilities.

By law, emergency care must be provided at the closest possible facility regardless of the patient's ability to pay. Except for health care services provided under Comprehensive Health Insurance or the ESSALUD, users generally must pay for drugs, laboratory tests, and in-hospital and ambulatory procedures. In the public sector, there are central state purchases of basic and generic drugs, which are then distributed to health facilities.

Peru's health care provision system has a component for managing the quality of care that includes medical audits; however, in spite of repeated attempts, it has not been possible to accredit fa-

cilities. Certification of health personnel is the responsibility of professional associations.

Health Promotion

With implementation of the Local Health Administration Committees, Law on the Coordinated and Decentralized National Health System, law on decentralization, and the Comprehensive Health Care Model, operative and legal foundations have been created to increase citizen participation in the collective promotion of health. Peru is encouraging the community participation of midwives; community workers; hospital volunteers; patient associations; family members of patients; health boards and committees; local and regional participatory health plans; and regional, provincial, and district health councils. At the same time, civil society is developing national health forums that bring together thousands of participants. These efforts consolidated the trend toward greater citizen participation and culminated at the end of 2006 in the National Health Conference.

Special mention should be made of the Local Health Administration Committees, which represent the association of communities with the Ministry of Health and in which organized citizens are delegated the authority to administer the local provision of health services; one-third of primary care facilities are administered in this manner. In the regions of Arequipa, Tacna, and Moquegua all facilities are administered by Local Health Administration Committees.

In addition, major efforts are being carried out for intersectoral actions, above all with the educational sector and the private sector, as was the case with the "Juntos" (or "Together") program (subsidy to the poor in exchange for vaccination, breast-feeding, institutional births, and school attendance). In general, Peru has been working toward greater and more sustainable social participation in health and toward improved health status based on rights and duties.

Health Supplies

Peru has a pharmaceutical industry that produces generic and national brands as well as laboratories that import and market most of the drugs the country needs. It is regulated and supervised by the General Office of Medications, Supplies, and Drugs (DIGEMID), which is the health authority on medications, medical devices, and reagents. It is estimated that only about half of the population with a health problem can access drugs prescribed through health services, primarily due to the limited ability of people to pay (with differences between urban and rural areas). Another major problem with regard to medications is the high incidence of forgery and contraband, which has led the Ministry of Health to strengthen the body in charge of controlling medications. In coming years, the effect of intellectual property in negotiations of a Free Trade Agreement could affect access to

A Strategy to Improve Access to Health Care by the Poor

The Comprehensive Health Insurance system was created in 2002 as a subsidy for the very poor who do not have health insurance (the population under 18 years of age, pregnant women, and targeted adult groups). The purpose is to reduce the limitations on access to health services represented by the existence of economic barriers and cultural and geographic differences. Some of the system's achievements are:

- It delivered approximately 79.1 million health benefits in just 60 months.
- It focuses efforts on free maternal and child care in rural and marginal urban areas.
- More than 1.2 billion *soles* have been spent on financing health benefits throughout the country.
- Free care has been provided for pregnant women, and by the end of 2006, 1,554,896 deliveries had been assisted by trained personnel.
- More than 2.7 million children up to age 4 and more than 196,000 poor mothers are covered.
- The system covers 7.1 million schoolchildren and youths (from 5 to 17 years old) even if they do not attend school regularly.

drugs, particularly if measures are not taken to prevent a substantial increase in prices (46).

There are standards that ensure Good Manufacturing Practices and a mandatory national registry of drugs and medical devices. During 2006, the national list of essential drugs for the public sector was revised, and centralized and joint purchasing for the entire sector was initiated with major savings. However, ESSALUD and the health services of the armed forces have not yet incorporated this mechanism.

The national capacity to produce vaccines is limited to anti-rabies vaccines, and the rest are purchased through the PAHO Revolving Fund for Vaccine Procurement. The Ministry of Health provides free vaccines to all public and some private providers.

Peru produces all low-complexity equipment and instruments used in health and medicine. More complex equipment is imported, primarily from the European Economic Community, Japan, the United States, Argentina, Brazil, Chile, and Colombia.

Human Resources

In 2005, there were 23,804 physicians, 21,332 nurses, 8,104 obstetricians, and 3,614 dentists working at the Ministry of Health, ESSALUD, and health provider companies (which jointly provide services to approximately 80% of the population). That same year, the rates per 10,000 population were 11.5 for physicians, 10.3 for nurses, 3.9 for obstetricians, and 1.7 for dentists. However, the distribution of these resources was unequal: Lima had a rate of 18.6 physicians per 10,000 population, which was 3.8 times higher than that of Huancavelica (4.9). In addition, there was a shortage of medical professionals in Ministry of Health facilities in 19 of the 25 departments; for example, the deficit of physicians in Cajamarca was 65% (47). If an equitable distribu-

tion were to be achieved, 24% of physicians, 14% of nurses, 12% of obstetricians, and 22% of dentists would have to be relocated (absolute index of dissimilarity).

The number of medical schools increased from 13 to 28 between 1992 and 2003, and nursing schools went from 34 to 44. Educational opportunities increased the number of medical graduates (from 951 in 1993 to 1,238 in 2003) and nursing graduates (from 1,402 to 1,760 during the same period) (47). In spite of the shortfall of professionals in most departments in Peru, there are few work posts available in health institutions, leading to unemployment and underemployment and migration of graduates (47). Between 1996 and 2004, 2 years after leaving Peru, 13,711 physicians, 7,340 nurses, 2,112 dentists, and 1,110 obstetricians had not returned to the country. This progressive imbalance is compounded by shortcomings in the training of human resources in health. The overcrowding in professional and technical health education has led to a deterioration in educational quality; the health education model is still centered on the hospital and disease and on highly specialized clinical and surgical care, to the detriment of education geared more toward public health (47).

Over the last 5 years, Peru has created an infrastructure to address problems in human resources, such as the Institute for Human Resources Development and the General Office for Human Resources Management, as a direct subsidiary of the highest managerial level of the Ministry of Health; in addition, Peru is carrying out efforts to strengthen leadership capacity by issuing National Human Resources Policies approved by the National Health Council. Also, there are signs that the situation could be beginning to correct itself: the recent development of regulatory mechanisms for educational training, the creation of the National System of Preliminary Study in Health (SINAPRES) for better coordination

of universities and health services, and the reorientation of financing, prioritizing only 22 medical specialties, which are better adjusted to the population's needs.

Sectoral reform processes and decentralization require a change in the occupational profiles of the work force. There is a broad supply of training with different sources of financing, administrative forms, and pedagogical concepts, which generates duplications and contradictions. Investment in training exceeded 2 million dollars in 2004. However, the high turnover of trained personnel calls into question the effectiveness of this investment (48).

The imbalance between the unplanned supply of professionals who graduate from universities and the limited capacity of the health system to absorb them can be seen in the number of posts for physicians offered by the Marginal Urban Rural Health Service (SERUMS), which in 2004 had 2,308 vacancies for 7,551 applicants. Those who did not obtain a position provided service of an equivalent nature, i.e. without remuneration.

Changes in contractual relationships of the last decade that made health employment precarious for a high percentage of health employees have begun to reverse. In November 2004, the Ministry of Health incorporated, through appointments, 3,040 physicians, who had been working with contracts. However, even though this change in labor relationship created employment stability for this group of professionals, it widened the gap of inequity in distribution because there were more appointees in departments with a higher number of physicians. This process of appointing hired people is extending to the rest of professional and technical staff. However, it conflicts with the fiscal ceiling set by the Peruvian government and aggravates the labor conflict that has been increasing in recent years: from 6 national strikes in 2003 to 11 in 2004.

Health Sector Expenditures and Financing

In 2000, national health spending was 4.4% of the GDP, and public health spending was 2.8%, while the per capita health cost was US\$ 97 (49).

As per the National Health Accounts for Peru, 1995–2000, in 2000, the main sources of financing were households (37.3%) through out-of-pocket expenses, the formal economy via payments of workers and employees into social security in health (35.0%), the government via the public treasury through indebtedness and ordinary resources (24.0%), and other organizations (including international cooperation) (3.7%) (49).

Technical Cooperation and External Financing

In 2004, 12.5% of total international cooperation funds to Peru were for the health sector (US\$ 48.6 million dollars, 50.4% were nonreimbursable international cooperation, and the rest was nongovernmental). There is a declining trend toward nonreimbursable official cooperation (in 1994, it was US\$ 56.8 million

and, in 2004, it was US\$ 24.5 million), as well as nongovernmental cooperation (in 1998, it was US\$ 58.6 million and, in 2004, it was US\$ 24.1 million).

Of the total money provided through international cooperation in 2004, 66.9% (US\$ 260.9 million) was aligned with an MDG. Of this quantity, 1.9% was directed toward the reducing infant mortality; 0.3% toward improving maternal health; and 2.9% toward combating HIV/AIDS, malaria, and other diseases (50).

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