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# PERU

## GENERAL SITUATION AND TRENDS

### Socioeconomic, Political, and Demographic Overview

Peru is located in the central-western part of South America. It has a surface area of 1,285,216 km<sup>2</sup> and is divided into three large natural regions: the coast, the mountains, and the jungle. Peru is a multicultural, multilingual, and multiethnic country. The Constitution of 1993 established the department as the main political-administrative unit (the country has 24 departments subdivided into 192 provinces, which, in turn, comprise 1,812 districts, plus one “constitutional province”).

State policy is influenced by two main trends: the promotion of economic liberalization and the effort to respond to basic social needs, many of which are unmet. According to the 1993 census, 53.9% of households had at least one unmet basic need. In response, the Government has decided to reform the functions of the State and reorient public spending in order to achieve greater efficiency in the use of resources and ensure that expenditures do not exceed tax revenues. This process implies limiting public functions to those areas that cannot be taken over by the private sector for reasons relating to national security, social equity, and market regulation. There are two basic objectives of State reform: (1) to free up financial resources by deregulating the market, privatizing State-run companies, and creating an institutional framework that is favorable to free enterprise; and (2) to restructure the general and specific functions of the State and to find the most effective and efficient use of proceeds. The State reform process is taking place in a context of fiscal and monetary austerity coupled with efforts to pay off foreign debts. Within the context of the restructure of general and specific State functions, alleviation of extreme poverty is a medium-term goal and forms the basis for the Government’s social policy. Within this policy, the health sector defines its target population through decentralized strategies.

The Peruvian economy has evolved with considerable ups and downs. The mid-1970s marked the beginning of a prolonged economic crisis that peaked in 1983 and 1989, with reductions in the gross domestic product (GDP) along the order of 12.6% and 11.7%, respectively. The periods of expansion have been short-lived, owing basically to the policy of import substitution that was promoted by the State and applied in combination with a relative price structure that was highly distorted. This policy collapsed in 1988 and generated a serious recession that was accompanied by hyperinflation, social disorder, and violence. Inflation began to be brought under control only in August 1990, when the new Government introduced stabilization measures. That year, the country experienced an unprecedented level of inflation (a 7,650% cumulative increase in prices). Since the fourth quarter of 1990, however, inflation has declined steadily, dropping to 12.5% in 1994 and to 10.4% in 1996.

Between 1987 and 1992, national output decreased 23.5%, and per capita output dropped 28.9%, which exacerbated the already high levels of poverty. Between 1993 and 1995, the gross national product (GNP) showed an upward trend, thanks to which in 1995 it was possible to recover the real levels of production that had prevailed in the country in 1987. This recovery occurred in a framework of stabilization and restructuring of the economy, as well as actions aimed at quelling internal violence and reintegrating the country into the international economic community. The recovery of private investment was supported by the success of anti-inflation measures and an increase in the Government’s credibility. Private investment rose in almost all sectors, especially in construction, commerce, agriculture, and manufacturing.

Despite the economic growth of the past several years and the political will that gave rise to poverty alleviation programs, progress in the social sector has been limited. Based on two methods of measuring poverty—the poverty line and unmet basic needs—it is estimated that around one-half of Peruvian families live in poverty. According to

the national surveys of living standards (ENNIV) conducted in 1985, 1991, 1994, and 1996, poverty levels declined from 53.6% to 49.6% between 1991 and 1994, and the latter value was maintained in 1996. According to the definition that has been consistently applied in the ENNIV surveys since 1985, poverty is the inability to cover the cost of a basic market basket of food and other goods and services. In 1994, 20% of the national population was living in extreme poverty. The percentage was even higher in rural areas of the coastal, mountain, and jungle regions (66%, 68%, and 70%, respectively). Extreme poverty is defined as the inability to cover the cost of a market basket consisting only of food that meets minimum nutritional requirements. The Lima metropolitan area has the lowest percentages of poor and extremely poor population: 38% and 5%, respectively. According to the 1993 census, 53.9% of Peruvian households had at least one unmet basic need. In rural areas, the proportion was 88.2%, while in urban areas, it was 39.2%. In 16 of the 25 departments, more than 60% of households had at least one unmet basic need. All except one were located in the Andean region or in the jungle. Based on these figures, the National Institute of Statistics and Information Science (INEI) classified the population in five "poverty strata." The provinces in which the poorest strata reside had the highest proportions of young people (under 15 years of age) and the lowest levels of intercensus growth, owing to migration of the population to escape poverty and political violence.

In 1995, the Ministry of Labor and Social Promotion redefined the concept of underemployment, which has altered its time-series data. "Open underemployed" describes workers who work less than 35 hours a week, who want to work more, and who are capable of doing so. "Hidden underemployment" refers to the situation of those who work more than 35 hours a week but earn less than the minimum wage. The minimum wage is based on the cost of a minimum market basket for a family of five with two income earners. According to data from late 1996, 7.1% of the economically active population (people over 15 years of age who are working or are actively seeking employment) was unemployed, 42.4% was underemployed, and only 49.0% had adequate employment. Underemployment based on income (hidden underemployment, 27%) was greater than underemployment based on hours of work (open underemployment, 16%), owing to a shorter work day. Underemployment was higher among females (51%) than males (37%) and among those with only a primary education (50% compared with 29% for those with a university education).

Illiteracy rates decreased from 18.1% to 12.8% in the intercensus period between 1981 and 1993, although notable differences between males and females persist, especially in rural areas. In 1993, the illiteracy rate was 7.1% among males;

among females it was 18.3%. In rural areas the rates were very high: 17.0% of males and 42.9% of females.

According to the IX Population Census and the IV Housing Census conducted in 1993, the total population of Peru was 22,639,443 inhabitants. The average annual population growth rate between 1981 and 1993 was 2.0%, maintaining the downward trend of the past 30 years. On the basis of this intercensus growth rate, it is estimated that the total population of Peru as of 30 June 1996 was 23,946,800. In 1993, 70.1% of the national population was urban (15,870,250 inhabitants). The growing process of urbanization is evident when this figure is compared with the figures for 1972 (59.5%) and 1981 (65.2%). Between 1981 and 1993, the average annual growth rate of the urban population was 2.8%, while that of the rural population was 0.9%. In that same year, females made up 50.3% of the total population, and more than a third of the population (37.0%) was under 15 years of age. The proportion of the population aged 65 and over increased from 4.1% in 1981 to 4.6% in 1993.

The crude birth rate declined from 35 births per 1,000 population in 1980 to 26 per 1,000 in 1996. The total fertility rate, which until the 1960s was more than 6.5 children per woman, declined to 4.0 children per woman in 1991. The total fertility rate varied at the departmental level, ranging from a low of 2.2 children per woman in Callao to highs of 6.5 and 5.9 in Huancavelica and Apurímac, respectively. According to the 1996 Demographic and Family Health Survey (ENDES), the total fertility rate was 3.5 children per woman nationwide (2.8 in urban areas, 5.6 in rural areas, and 2.5 in the Lima metropolitan area). Fertility also varied considerably with the educational level of women: from a total fertility rate of 6.9 among women with no schooling and 5.0 among women with only a primary education to 3.0 and 2.1 for women with secondary schooling and higher education, respectively.

Life expectancy increased from 53.6 to 66.3 years between 1970 and 1993. In 1993, the departmental rates ranged from 54.4 in Huancavelica to 77.1 in Callao; these differences have persisted over time. In the 1993 census, 22.3% of the population (4,921,020 inhabitants) indicated that they had been born in a place different from their place of residence at the time of the census. Most of this internal migration was absorbed by Lima (48.1%) and Callao (7.8%). Other urban centers that received significant proportions of the migrant population were Arequipa (5.1%), La Libertad (4.0%), Lambayeque (3.7%), San Martín (3.6%), and Junín (3.5%). The departments that lost population due to migration were Cajamarca (9.9%), Ancash (7.5%), Ayacucho (6.5%), and Puno (6.1%). In addition to the traditional causes of internal migration, a sizable number of people migrated to escape violence and its attendant problems, although the precise number has not been determined. In the past three years, internal

migration has intensified as displaced persons have returned to their places of origin, thanks to successful efforts to stem violence and to the development of new agricultural and mining areas in mountain and jungle regions. International emigration has increased in recent decades. The country registered a net population loss of 36,000 in the 1975–1980 period and 370,000 in the 1990–1995 period.

### Mortality Profile

In 1992, underreporting of deaths at the national level was estimated at 50.8%. The departments with the highest levels of underreporting were Ayacucho (99.4%), Amazonas (80.5%), Loreto (79.7%), and Huancavelica (76.9%); the departments with lowest rates were Ica (14.3%), Tacna (19.6%), and Lima (22.6%). For the five poverty strata, the underregistration rates are 27.1%, 36.0%, 53.0%, 74.9%, and 75.1%, respectively. Of all reported deaths, the proportion with death certificates was 70.6% nationwide. The rate at the departmental level ranged from 97.9% in Callao to 24.4% in Apurímac. By poverty stratum, the rates ranged from 90.6% in stratum I to 33.0% in stratum V. The proportion of deaths attributed to ill-defined signs, symptoms, and conditions was 30.6% overall. In poverty stratum I this proportion was 9.9%, and in stratum V it reached 69.8%.

Analysis of proportional mortality by the six major groups of causes showed that at the national level communicable diseases were the leading cause of death, followed by diseases of the circulatory system and malignant neoplasms, which accounted for 27.5%, 19.4%, and 15.2% of all deaths, respectively. In stratum I, diseases of the circulatory system ranked first (22.1%), closely followed by communicable diseases (21.5%) and malignant neoplasms (19.3%). In stratum V, on the other hand, communicable diseases were responsible for 44.0% of all deaths; diseases of the circulatory system for 10.2%; and malignant neoplasms for only 4.6%. The risk of dying from a communicable disease was 6.3 times greater in stratum V than in stratum I (mortality rates of 6.9 and 1.1 per 1,000 population, respectively). Mortality from certain conditions originating in the perinatal period also showed marked differences among strata (43.2 per 1,000 live births in stratum V and 12.6 per 1,000 in stratum I).

With regard to the structure of mortality by age groups, of all the deaths in stratum I, 13.1% and 2.9%, respectively, occurred among children under 1 and children aged 1–4 years; in stratum V these percentages were 29.3% and 11.1%, respectively. The risk of dying was five times higher for children under 1 in stratum V than in stratum I (151.1 and 31.0 per 1,000 children under 1) and seven times higher for children aged 1–4 (13.9 per 1,000 children aged 1–4 in stratum V compared with 1.8 in stratum I).

The 10 leading causes of death were acute respiratory infections (16.3%), intestinal infectious diseases (7.7%), diseases of pulmonary circulation and other forms of heart disease (5.4%), tuberculosis (5.0%), cerebrovascular disease (4.0%), diseases of the urinary system (3.5%), diseases of other parts of the digestive system (3.2%), nutritional deficiencies and anemias (3.2%), ischemic heart disease (3.2%), and hypoxia, birth asphyxia, and other respiratory conditions of the fetus or newborn (3.1%). This analysis, classified by strata, shows enormous variability. While acute respiratory infection was the leading cause of death in all strata, the relative importance of this cause increased with the degree of poverty: from 9.3% in stratum I to 25.2% in stratum V, which means that the risk of dying from this cause was 8.6 times greater in stratum V than in stratum I. The relative risk of dying from intestinal infectious diseases in stratum V was 7.8 times greater; from tuberculosis, 2.6 times greater; from hypoxia, birth asphyxia, and other respiratory conditions of the fetus or newborn, 6.0 times greater; from nutritional deficiencies and anemias, 4.3 times greater; and from appendicitis, hernia of the abdominal cavity, and intestinal obstruction without hernia, 18.5 times greater.

## SPECIFIC HEALTH PROBLEMS

### Analysis by Population Group

#### *Health of Children*

According to the 1993 census, infant mortality was 59.0 per 1,000 live births nationally, and ranged from 22.9 per 1,000 in Callao to 113.9 per 1,000 in Huancavelica. For the period 1995–2000, this indicator was estimated at 45.0 per 1,000 live births. The 1996 ENDES survey revealed a rate of 42.8 per 1,000. Neonatal mortality, according to the same source, was 25.0 per 1,000 live births. In 1992 the leading cause of death in children under 1 year of age was communicable diseases (39.8%), followed by certain conditions originating in the perinatal period (33.9%). Within the group of communicable diseases, acute respiratory infections (26.6%) and intestinal infectious diseases (11.1%) accounted for the largest proportions of deaths. However, these proportions varied significantly among the different poverty strata: communicable diseases and conditions originating in the perinatal period accounted for 29.7% and 39.3%, respectively, of deaths of under-1 children in stratum I and 49.6% and 29.1%, respectively, in stratum V. Among children aged 1–4, communicable diseases were the leading cause of death (66.7% at the national level, 55.2% in stratum I, and 74.7% in stratum V), followed by external causes (7.3%). Among the communicable diseases, respiratory infections caused 28.5% of all deaths and intestinal infectious diseases caused 25.1%.

According to the first national height census of school-children in the first grade of primary school (1993), 48.0% of children aged 6–9 suffered from chronic malnutrition. The situation was more serious in males (54%) and in rural areas (67%). The department that had the highest rate of malnutrition was Huancavelica (72%), while the lowest rates were found in Tacna (18%) and Callao (20%). According to mortality data from 1992, the principal causes of death in this age group were communicable diseases (46.8%) and external causes (20.2%).

### *Health of Adolescents*

According to the 1993 census, adolescents made up 23.0% of the total population. The leading causes of death in the group aged 10–14 years were communicable diseases (40.2%) and external causes (21.7%); these proportions are reversed in the group aged 15–19 years (25% and 39.0%, respectively). The same census revealed that 13.6% of children aged 10–14 years were not attending school. The proportion increased to 26.7% in the group aged 15–17 years. The problem was most pronounced among females in rural areas (23.7%). In the group aged 10–14 years, 5.1% worked. Among those between 15 and 17 years of age, 17.9% worked. It was also found that, in urban areas, 69.0% of adolescents aged 12–14 had consumed alcohol at least once and 17.0% had used tobacco; in the group aged 15–18 years these percentages were 84.0% and 50%, respectively. With regard to the use of other drugs, 7 of every 1,000 children aged 12–14 admitted to having used marijuana at least once.

The fertility rate among adolescents has declined in recent decades, although not in the same proportion as in other age groups. Among women aged 45–49, fertility dropped 67.0% between 1961 and 1993, but in those aged 15–19 years it decreased only 43.0%. In 1993, 1.2% of girls aged 12–14 years and 6.0% of those aged 15–17 years had already had a child or were pregnant for the first time. Among adolescents in rural areas, the latter figure was 10.6%. Although 29.0% of adolescent girls aged 15–19 years who were in a sexual relationship indicated that they used some method of contraception, only 11.0% used a modern method. The vast majority of pregnancies among adolescents are unwanted, and they almost always end in abortion. In 1993, adolescents accounted for 15.0% of all maternal deaths, and an estimated 20.0% of maternal deaths from abortion occurred in this age group.

### *Health of Women*

In 1996, 64.0% of women living with a male partner were using some method of contraception. In urban areas, the per-

centage was 70.0%, and in rural areas it was 51.0%. Seventy-five percent of women with higher education used some type of contraceptive method, while only 38.0% of women with no schooling did so. The most widely used method continues to be the rhythm method (18%), followed by the intrauterine device (12.0%) and female sterilization (10.0%). In 1992 and 1996, 63.9% and 66.2% of pregnant women, respectively, received prenatal care from a health care professional; in rural areas, the proportion was 44.5%, while in the Lima metropolitan area it was 87.4%. In the same two years, 52.5% and 55.1% of women, respectively, received professional care during childbirth. This indicator is lower in rural areas (19.1%) and in the jungle region (34.4%) compared with Lima (93.0%).

The maternal mortality rate is 265.0 per 100,000 live births. It is estimated that around 1,670 women die annually as a consequence of complications of pregnancy, childbirth, and the puerperium. In urban areas, the rate is 200.0 per 100,000 live births, and in rural areas it is 448.0 per 100,000. The maternal mortality rate is 10 times higher among illiterate women than among those with a higher education (448.0 and 49.0 per 100,000 live births, respectively). The leading direct obstetric causes of maternal mortality are hemorrhage (23.0%), abortion (22.0%), infection (18.0%), and toxemia (17.0%); the leading indirect cause is pulmonary tuberculosis.

### *Health of Adults*

In 1992 the leading causes of death in the population aged 15–59 years were infectious diseases (21.9%), external causes (20.8%), and malignant neoplasms (17.6%). The distribution classified by poverty strata I and V was as follows: malignant neoplasms (23.8%), infectious diseases (21.3%), and external causes (11.8%) for stratum I; infectious diseases (32.3%), external causes (18.2%), and malignant neoplasms (6.5%) for stratum V. There were significant differences in the causes of death among men and women. Among men, the leading causes were tuberculosis (10.0%); homicide and intentional injury, injuries due to legal interventions and operations of war (8.4%); other accidents, including after-effects (6.6%); acute respiratory infections (6.4%); and motor vehicle traffic accidents (5.4%). Among women, the leading causes were tuberculosis (9.6%), malignant neoplasms of the uterine cervix (7.0%), acute respiratory infections (6.1%), cerebrovascular disease (4.5%), and malignant neoplasm of the breast (4.0%).

### *Health of the Elderly*

Among the population aged 60 and over, diseases of the circulatory system are the primary cause of death (30.2%),

followed by infectious diseases (20.9%) and malignant neoplasms (19.1%). In stratum I, diseases of the circulatory system accounted for 31.7% of all deaths, followed by malignant neoplasms (21.8%) and infectious diseases (17.3%); in stratum V, communicable diseases continued to be the leading cause of death (34.7%), followed by diseases of the circulatory system, which ranked a distant second (18.9%), and malignant neoplasms (5.9%). There are no significant differences according to sex.

### *Workers' Health*

The Peruvian Social Security Institute (IPSS) has an Occupational Health Program, but it covers only 28.0% of the country's economically active population (7,814,809 people). Only 7.8% of wage earners are unionized. Since 1997, the Ministry of Health also has had an Occupational Health Program. According to IPSS, between 1995 and 1996 the occupational accident rate rose from 12.0 to 20.0 per 1,000 workers and fatal accidents increased from 0.7 to 1.9 per 10,000 workers. In part, these figures reflect an improvement in record-keeping, although in the case of fatal accidents the increase is real, because it has been verified on the basis of information provided by unions and by other ministries. Accidents occur mainly as a result of inadequate working conditions, combined with increases in workload. In the mining sector alone, 102 fatal accidents were registered in 1995 (compared with 68 in 1992, 57 in 1993, and 87 in 1994). Data on occupational illnesses are limited, although several studies have suggested that there are serious problems (hearing loss, asbestosis, pneumoconiosis). Another major problem is lack of access to occupational health services for workers in the informal sector (53.9%); the situation of these workers is exacerbated by a higher risk of becoming ill or being injured because of poor and hazardous working conditions and low wages. Based on the 1991 national census, in 1993 the INEI estimated the total number of children aged 6–14 who work at 175,022; the estimate of the Ministry of the Presidency for 1995 was 1,100,000 working children under the age of 18. These children work mainly in mining, agriculture, and in gold ore processing.

### *Health of Indigenous People*

The indigenous population of Peru can be classified according to language and place of residence. Based on native language (Quechua, Aymara, or another indigenous language), a 1993 census identified 4,035,300 indigenous persons, 52% female and 48% male. Of this number, 75.0% resided in mountain areas, 9.0% in the jungle, and 17% in coastal regions, including the Lima metropolitan area. Of the

indigenous population over 6 years of age, 22.0% had no schooling; the situation was even more serious in rural areas, especially among women. Forty-two percent of the indigenous population lived in extreme poverty—double the national average. A significant proportion were rural or unskilled workers, with cultural traits that often put them at a disadvantage for finding employment. Those who resided in rural mountainous areas and in the jungle had limited access to education and health services, owing partly to the geographic characteristics of their place of residence and partly to language and cultural barriers. With respect to basic sanitation services, 54% of Quechua speakers and 70% of Spanish-speaking indigenous persons had water service in their homes; the coverage of wastewater systems was 15% and 40%, respectively. Among the Quechua speakers, only 32% of those who reported that they had been sick or injured in the four weeks before the interview had received medical attention, compared with 46% of the Spanish speakers. The average expenditure of a Spanish-speaking person was 65% greater than the average expenditure of a person who spoke some indigenous language. These data suggest that investing in bilingual education that is adapted to indigenous cultural features is an essential strategy for overcoming the poverty that affects this group.

With regard to the indigenous communities living in jungle areas, in 1993 there were 13 linguistic families and 65 ethnic groups. The total population was 299,218 inhabitants (48% female and 52% male). The most populated departments were Loreto, with 83,746 indigenous inhabitants; Junín, with 57,530; Amazonas, with 49,717; and Ucayali, with 40,463. Of the total population surveyed, 49.7% were under 14 years of age, 48.8% were between 15 and 64, and 1.5% were 65 or older. By educational level, 32% had no schooling, 49% had a primary education, 16% had a secondary education, and 2.5% had a higher education. The curricula studied by the indigenous population were the standard curricula used in urban areas and did not take into account indigenous languages or sociocultural characteristics. Seventy-four percent of the indigenous population lived in poverty and more than half lived in extreme poverty; these figures are much higher than the national averages (49.6% and 20.2%, respectively). In the Campa-Ashaninka group, the fertility rate was 8.1 children per woman and infant mortality was 99 per 1,000 live births. Among the Machiguenga of Cuzco and Madre de Dios, the fertility rate was 8.4 children per woman and infant mortality was 100 per 1,000 live births. In the Peruvian jungle, the majority of the population engages in subsistence activities such as farming, hunting and gathering, and fishing. The indigenous population also makes greater use of medicinal plants. These communities have been exposed to political and social strife and to violence associated with drug trafficking, as well as forced migration, abandonment of their envi-

ronment, and precarious living conditions. The Government has identified priority areas of intervention in health, education, and agriculture, as part of the strategy for poverty alleviation and support for communities in border areas.

## Analysis by Type of Disease or Health Impairment

### Communicable Diseases

**Vector-Borne Diseases.** The number of cases of malaria increased from 30,814 in 1989 to 211,561 in 1996, with an incidence rate of 885.0 per 100,000 population. The annual parasite index (API) increased from 2.4 per 1,000 in 1992 to 8.8 per 1,000 in 1996. The proportion of cases due to *Plasmodium falciparum* increased alarmingly from 1.6% in 1992 to 28.3% in 1996. Malaria is associated geographically and environmentally with the tropical and irrigated desert areas of the northern coast and the northeastern mountainous jungle region, the central-southeastern jungle region, and the lowland or Amazon jungle. The seasonal nature of the disease is evident along the northern coast and northwestern region of the country (higher incidence in the first half of the year), but transmission rates remain constant in the Amazon basin. In 1996, the population in high-risk areas numbered 2,382,035 (9.9% of the total population of the country), which reflected a reduction with regard to the at-risk population in 1994 (15.9%). That same year, 77.9% of the reported cases were concentrated in five regions and health subregions (Loreto, Jaén, Luciano Castillo, Junín, and San Martín), and 88.4% of the *P. falciparum* cases were concentrated in the first three. Loreto and Jaén reported 55.2% of all cases. The incidence leveled off in 1996, when a significant decline was observed in some high-risk areas located along the northern coast, but epidemic and unstable behavior persisted in lowland jungle areas, especially the Loreto region (where even the city of Iquitos was affected) and the Jaén subregion. Stratification by API between 1994 and 1996 revealed an increase from 20.7 to 119.1 per 1,000 in Loreto and from 27.7 to 39.8 per 1,000 in Jaén. The proportion of cases due to *P. falciparum* in 1996 was 32.2% in Loreto and 48.2% in Jaén. In the latter year, there were 46 reported malaria deaths, 40 of which occurred in Loreto (87.0%). Of the *P. falciparum* cases, 20% to 26% were resistant to chloroquine and 9.1% were resistant to sulfadoxine/pyrimethamine. Intense internal migration, the development of new irrigation areas for rice and cotton farming, the spread of the vector *Aedes darlingi*, and difficulties in management of the control program in hard-to-reach areas contributed to this epidemiological situation. Since 1994, control efforts have focused on detection, diagnosis, and treatment of cases as well as comprehensive and selective vector control, prevention and control of epidemics, and systematization of the analysis of operational

and epidemiological information. Between 1994 and 1996, coverage of the control program increased from 41.4% to 75.0% in the general health services, and the capacity for the detection, examination, and diagnosis of fever cases increased 472%. The efficiency of the administration of treatment increased during the same period from 63.2% to 83.1% for *Plasmodium vivax* malaria and from 56.7% to 82.6% for chloroquine-resistant *P. falciparum* malaria.

The first epidemic of dengue fever occurred in 1990, when 9,623 cases were reported. Control activities reduced the incidence to 714 cases in 1991 but since then the trend has been upward: 1,905 cases in 1992 and 2,837 in 1996. The serotypes involved in the period 1990–1995 were dengue 1 and, to a lesser extent, dengue 4. Dengue 2 began to circulate in 1995; it was first isolated in Los Órganos (Grau region in the northern part of the country) and in 1996 was detected in other areas of the northeastern region and in the Amazon basin. The most affected geographic areas have been the northern coast (Tumbes and Luciano Castillo) and the northeastern and central jungle region (Loreto, Ucayali, Huánuco, Junín, and San Martín). In 1996 outbreaks were registered in several new localities not considered endemic (Jaén, Bagua, and Juanjui). It was estimated that the population at risk in 1996 totaled 2,750,000 people.

Leishmaniasis is present in 24 health subregions—in particular, the mountain and jungle departments. Between 1960 and 1980 the incidence of the disease remained relatively stable, ranging from 6.5 to 8.4 per 100,000 population. Between 1985 and 1994 an increase in incidence was observed; the rate increased from 12.7 to 40.0 per 100,000 population. In 1995 a total of 7,343 cases were reported (31.9 per 100,000 population). The total for 1996 was 7,756 (32.4 per 100,000 population), which points to a new period of stabilization. In 1996, 86.7% of the cases were the cutaneous form and 13.3% were the mucocutaneous form. The most affected subregions were Madre de Dios (1,071 cases) and Chachapoyas (659 cases). The Andean cutaneous form affects primarily children under 15 and is associated with the increasing use of child labor for brush clearing and preparation of farmlands on mountain slopes of the Andes, as well as with transmission around the home. The mucocutaneous form occurs most frequently in persons over the age of 15 years and is associated with temporary migration or settlement of highland and lowland jungle areas for agricultural and extractive activities (gold mining, logging, oil drilling), as well as with road-building and hunting.

In 1995, jungle yellow fever reached epidemic proportions, with 503 reported cases and a case fatality rate of 38.8%. The disease affected predominantly farmers aged 15–44 years who were of Andean origin and resided in the departments in the central jungle (Pasco, Junín, and Huánuco). The large increases in internal migration beginning in 1994, coupled with

the opening up of new agricultural and industrial areas in enzootic areas, were decisive factors in the occurrence of the outbreaks. Intensification of vaccination activities brought about a reduction in the incidence to 86 cases with 34 deaths in 1996. In April 1995, yellow fever vaccination was incorporated into the regular activities of the Expanded Program on Immunization.

In 1996 the total number of cases of Chagas' disease in endemic areas was estimated at 24,170 (1,209 were acute or oligosymptomatic forms and 22,961 were chronic forms). Most cases occurred among people between the ages of 20 and 54. The area where Chagas' disease is most prevalent is located in the country's southern portion (departments of Ica, Arequipa, Moquegua, Tacna, Ayacucho, and Apurímac), where household infestation with *Triatoma infestans* has been detected in 21 provinces and 90 districts. In this geographic area, which represents 9% of the national territory and contains 160,000 dwellings, 473,918 people (2% of the total population) are at risk for the disease. Seroprevalence surveys in these areas have revealed infection rates ranging from 0.7% to 12.0% in the population and from 3.0% to 12.0% in blood banks. In 1996 the country developed national standards and formulated regional control plans.

Between 1945 and 1969, the incidence of bartonellosis declined from 9.6 to 0.25 per 100,000 population and remained stable until 1974, when it began to rise steadily. In 1995, a rate of 3.34 per 100,000 population was registered. Bartonellosis affects the departments of Ancash, La Libertad, Cajamarca, and Amazonas. The exposed population of 1,687,236 people lives mainly in ecological niches located between 1,000 and 3,200 m above sea level. The incidence is highest in children under 15.

**Vaccine-Preventable Diseases.** Since 1990, vaccination coverage in children under 1 year of age has exceeded 80%. In 1996, coverage levels were 96.9% for the measles vaccine, 99.6% for BCG, and 100% for polio vaccine and DTP. The last measles epidemic in Peru occurred in 1992, when 22,605 cases and 263 deaths were reported (case fatality rate of 1.8%). The measles elimination program was launched in 1995 with surveillance of eruptive febrile illnesses and door-to-door vaccination activities, as a result of which 96.8% of children aged 9 months to 4 years were vaccinated. A total of 224 cases of measles were confirmed in 1995, and only 2 cases were confirmed in 1996. A campaign to eliminate neonatal tetanus as a public health problem was launched in 1991. High-risk districts were identified and all women of childbearing age were vaccinated with tetanus toxoid (TT). In addition, traditional birth attendants and health workers were trained both in how to provide care at delivery and in how to administer vaccines. A total of 128 cases were reported in 1994, 9 in 1995, and 46 in 1996; the majority were

from high-risk districts in the jungle and in marginal urban areas of the coastal region. All cases were in children of mothers who had not received at least two doses of TT, and the mother had given birth in a health institution in only 5% of the cases. According to the 1996 ENDES, 70.1% of the mothers who had given birth to children in the five years before the survey had received at least one dose of TT. The last confirmed case of poliomyelitis in the Americas occurred in Peru in 1991. As of early 1997, the country maintained adequate monitoring of all suspected cases and adhered to international surveillance requirements. Diphtheria is under control; 10 or fewer cases of the diseases were reported between 1992 and 1996, with the exception of 1993, when 31 cases were reported, and most of those (24) occurred during an outbreak in a rural area of the department of Cuzco. Peru ranks among the countries with medium endemicity of the hepatitis B virus. Various seroepidemiological studies have revealed that endemicity in the jungle is medium to high, with prevalence of the surface antigen (HBsAg) ranging from 2.5% in Iquitos to 20.0% among the native population. Along the coast, the prevalence ranges from 1.0% to 3.5%, and in the mountains, from 2.0% to 15.0%. The disease is hyperendemic in Huanta and Abancay, where the prevalence of HBsAg is as high as 54.4% and that of the hepatitis delta virus is 14% in apparently healthy schoolchildren. In these areas, horizontal transmission in children is frequent. In 1996, immunization of children under 1 year with the hepatitis B vaccine was initiated in provinces with high and medium levels of endemicity (25% of the total area of the country).

**Cholera and Other Intestinal Infectious Diseases.** In 1996, the point prevalence of diarrhea in children under 5, on the 15th day before the survey, was 17.9%, much lower than the figure found in a 1986 survey (31.9%). The prevalence was higher in children aged 6–23 months (29.0%), in rural areas (20.3%), and in jungle areas (25.6%). The seriousness of diarrheal disease, as measured by the proportion of cases with dehydration and serious dehydration, decreased from 34% and 4%, respectively, in 1994 to 25.5% and 1.5%, respectively, in 1996. According to the National Household Survey for the fourth quarter of 1995, 92% of children under 5 with diarrhea received oral rehydration therapy. The proportion of diarrhea cases that received appropriate treatment in the health services of the Ministry of Health increased from 7% in 1993 to 25.4% in 1996.

The appearance of cholera in early 1991 revealed the serious deficiencies in drinking water supply and basic sanitation services. Since then, the disease has shown a downward trend (322,562 suspected cases in 1991, 71,448 cases in 1993, and 4,369 cases in 1996) and has occurred mainly in persons over 15 years of age. The department with the highest rate of

cholera in 1996 was Ucayali, which reported 239 cases per 100,000 population. The average case fatality rate has remained at 0.09% since the beginning of the epidemic; however, higher figures have been reported in outbreaks occurring in areas with limited access to health services. National monitoring of *Vibrio cholerae* strains indicates the absence of serotype O139. Cholera is endemic in Peru, and isolated cases of the disease routinely occur between December and March along the coast and between June and October in the jungle.

**Chronic Communicable Diseases.** Rates of tuberculosis increased between 1985 and 1992, when a steady downward trend began and continued until 1996. Case reporting has improved substantially since 1991. In 1996, 47,498 cases were diagnosed and treated nationwide; the prevalence rate declined from 256.1 per 100,000 population in 1992 to 227.9 in 1995 and 198.4 in 1996. The rate of incidence of the disease dropped from 243.2 per 100,000 population in 1992 to 162.1 in 1996. The most affected age group consisted of individuals between 15 and 44. The proportion of sputum-positive cases detected in children under 15 was 4.8%. The incidence rate of tuberculous meningoencephalitis in children declined from 2.01 per 100,000 population in 1993 to 1.57 in 1995. Mortality decreased slightly from 5.2 to 4.9 per 100,000 population between 1992 and 1995; the reduction occurred in all age groups but was most evident in the youngest groups. The first annual survey of risk of infection was conducted in 1997. A study of tuberculosis drug resistance in Peru in 1995–1996 found that 15.4% of cases were resistant to one drug and 2.4% were multidrug resistant. In 1990 only 25% of the country's health services were carrying out diagnosis and treatment activities, but by 1996 96.0% guaranteed free access to such care. The number of sputum microscopy examinations quintupled between 1990 and 1996 (211,000 and 1,160,000, respectively). In the 1980s, only 50% of diagnosed patients completed treatment, and in 1996 the average cure rate nationwide was 90.9%. An assessment of treatment efficiency through cohort studies revealed that the cure rate increased from 74.1% in 1991 to 90.9% in 1996. The treatment abandonment rate declined from 13.8% in 1991 to 4.2% in 1996.

The prevalence of leprosy in endemic areas of the jungle in 1995 was 0.9 per 10,000 population, and the incidence was 0.35 per 10,000 population. These rates were higher than in 1993 (0.6 and 0.1, respectively), mostly because of better detection of new cases. The most affected departments were Ucayali and Loreto. Of the 240 cases recorded in 1995, 195 were multibacillary (81.3%) and 45 paucibacillary (18.8%). Of the 90 new cases, 14.4% were detected in children under 15, which indicates recent transmission of the disease; 13.3% have second-degree disability, which suggests a late diagnosis. The latter percentage is lower than in 1993 (20.4%).

**Acute Respiratory Infections.** Acute respiratory infections are the leading cause of mortality in childhood; it is estimated that every year they cause about 12,000 deaths in children under 5 years, of which a high proportion are due to pneumonia. Acute respiratory infections are the leading reason for health service visits, accounting for more than 40% of all such visits and 30% of hospitalizations in this age group. The highest incidence of pneumonia is registered in the mountains (Pasco and Apurímac) and in the jungle (Jaén, Madre de Dios, and Amazonas). Between October and November 1995 a survey on quality of care in health services determined that 39.2% of the cases of acute respiratory infections received appropriate treatment in hospital outpatient clinics, health centers, and health posts.

**AIDS.** Since its detection in Peru in 1983, AIDS/HIV infection has spread rapidly. The cumulative total of AIDS cases as of August 1997 was 6,443; the estimated number of cases is 10,000 for AIDS and 70,000 for HIV infection. The presence of HIV/AIDS has been confirmed throughout the country, although it is more prevalent in the large cities, particularly in Lima and Callao. Sexual transmission predominates and accounts for 95.4% of the cumulative total of cases; transmission by blood accounts for 2.4% of cases and the trend for this route of transmission is downward; perinatal transmission accounts for 2.2% of cases and the trend is upward. Significant changes in transmission patterns include the rise in heterosexual transmission and the increase in the number of women and young people who are affected. The male/female ratio of cases was 20:1 in 1985 and 3:1 in 1997. In the same period, the median age at the time of AIDS diagnosis dropped from 38 to 29 years, which suggests that HIV infection is occurring at increasingly younger ages. Since 1994 the National Program for the Control of Sexually Transmitted Diseases and AIDS has implemented new control strategies, including marketing of condoms, modification of risk behaviors, and syndromic management of other diseases. In addition, the Ministry of Health has instituted a program that administers AZT free of charge to infected pregnant women and newborns, and it is carrying out activities aimed at eliminating congenital syphilis and ensuring mandatory screening in blood banks. Law 26626, enacted in 1997, and its accompanying regulations establish the legal framework for carrying out these activities and provide explicit protection of the rights of people with HIV/AIDS.

**Rabies and Other Zoonoses.** During the 1993–1996 quadrennium, 112 deaths from rabies were reported; in 65 of these cases (58%) the source of infection was dogs and in 47 (42%), vampire bats. In marginal areas of the large cities, most cases of human rabies are due to dog bites; males and school-age children are most often affected. Human rabies

transmitted by vampire bats has become a serious problem in the Amazon jungle as a result of human intrusion into bat habitat. In the 1993–1996 period, 1,582 cases of canine rabies were reported.

Between 1990 and 1992, Peru had 460 cases of anthrax. The largest number of cases (223) was reported in 1992; in 1993 and 1994 no cases were reported; in 1995, 25 were reported; and in 1996, 12 cases were reported. The departments that periodically report cases of anthrax are Lima and Ica as well as the Constitutional Province of Callao.

Brucellosis is limited to certain regions of the country and is related to consumption of fresh homemade cheese produced with infected goat milk. A total of 3,606 cases were reported between 1993 and 1995. In 1996, 274 cases were reported in Lima alone.

The endemic area for plague is limited to four departments in the northern part of the country: Piura, Cajamarca, Lambayeque, and La Libertad, where periodic outbreaks occur in the inter-Andean valleys. An outbreak of bubonic plague began in October 1992 and eventually spread to 122 localities in 31 districts of the four departments. Between 1994 and 1996, 1,288 cases and 54 deaths were reported, most in the department of Cajamarca. The occurrence of cases is related to the proliferation of wild rodents as a result of deficient environmental sanitation and poor housing conditions in these areas.

Human hydatidosis occurs in the Andean region (Pasco, Huancavelica, Junín, and Puno), where sheep breeding is a major economic activity and herds of sheep live in close contact with dogs infested with the adult parasite. Between 1993 and 1995, 4,829 cases of hydatidosis were diagnosed, mainly the pulmonary and hepatic forms.

#### *Noncommunicable Diseases and Other Health-Related Problems*

**Nutritional Diseases and Diseases of Metabolism.** In 1996, 7.9% of children under 5 had weight-for-age deficits and 1.1% had weight-for-height deficits, figures moderately lower than those registered in 1992 (10.8% and 1.4%, respectively). Low height-for-age affected 25.9% of children under 5 overall, but in those close to their fifth birthday the proportion was 30.5%. The high prevalence of chronic malnutrition can be attributed to inadequate intake, poor use of food, and frequent and prolonged episodes of infection that trigger a vicious cycle of malnutrition and infection. The highest level of chronic malnutrition, 40.6%, is found in rural areas. In the Lima metropolitan area, in contrast, the figure is 10.1%. The prevalence is 17.1% along the coast, 37.9% in the mountains, and 33.3% in the jungle. Also, 50.5% of the children of mothers with no formal education suffer from chronic malnutrition compared with 5.3% of those whose mothers have higher education. There are

no up-to-date statistics on vitamin A and iron deficiency. A study conducted in Piura in 1991 found that 32.8% of children under 6 had serum levels of vitamin A less than 20  $\mu\text{g}/\text{dl}$ . In 1987 it was established that iodine deficiency was endemic in most of the mountain and jungle provinces of the country. In 1990, 70% of the salt consumed in the country was iodized. By 1995, according to the National Household Survey for the fourth quarter, 93.9% of the population was consuming iodized salt.

The practice of breast-feeding is prevalent in Peru, but the period of exclusive breast-feeding usually is very short. Supplementation with other liquids and food—usually prepared under poor hygienic conditions—occurs at early ages. In 1996, 38.9% of children under 3 months of age were already receiving food supplements, and among those 4–6 months old, only 32.3% continued to be exclusively breast-fed. The proportion dropped to 5.6% in children aged 7–9 months.

Studies conducted in three coastal areas showed the prevalence of diabetes to be between 7% and 8%. The prevalence of hypercholesterolemia was between 14% and 42% in the same areas.

**Cardiovascular Diseases.** In recent decades noncommunicable diseases have gained importance in Peru. Proportional mortality from diseases of the circulatory system between 1980 and 1992 ranged from 11.8% to 19.4% of all deaths from defined causes. The estimated mortality rates from these diseases for the 1990–1992 period were 186 and 209 per 100,000 population in men and women, respectively. The prevalence of hypertension in adults was estimated at 17% in coastal regions and at about 5% in mountain and jungle regions, although studies conducted in three areas of the coast showed prevalence rates of 15% to 34%.

**Malignant Neoplasms.** Data on the incidence and prevalence of malignant neoplasms at the national level are not available, although information is available from two regional reporting systems, one in the Lima metropolitan area and another in the city of Trujillo. In Lima, the incidence was 88.3 per 100,000 population in 1968 and 112.3 in 1990–1991. Mortality from cancer in 1990–1992 was estimated at 113 and 138 per 100,000 population in males and females, respectively. According to the cancer registries of Trujillo (1988–1989) and Lima (1990–1991), the most frequent cancer sites in males are the stomach, prostate, and lung; in women, they are the uterus, breast, and stomach. In men, between 1968 and 1991 the frequency of stomach cancer decreased 37%, while that of prostate cancer increased 48%. In women, cervical cancer decreased 32%, while breast cancer increased 43% in the same period.

**Accidents and Violence.** Homicides (12 per 100,000 population) and traffic accidents, together with various forms of

violence against children, adolescents, and women, constitute a serious public health problem in Peru. In adults, accidents are the most frequent reason for hospitalization and for trips to hospital emergency rooms. Between 1980 and 1995, the National Police registered close to 990,000 traffic accidents, with 320,000 injuries and a case fatality rate of 12.3%.

**Oral Health.** In 1996, 95% of children aged 3–14 had dental caries, 85% suffered from periodontal disease, and 75% from malocclusion. In children aged 6–14 years, the average number of permanent teeth affected by caries was six, with premature loss of first permanent molars in 45% to 50%. In the same year, the Ministry of Health launched a program to promote topical fluoride application as a part of comprehensive child health services.

**Ocular Health.** It is estimated that 10% of the country's total population suffers from refractive defects; in the school-age population of some areas of the country this proportion is as high as 15%. The prevalence of blindness in adults over the age of 60 is estimated at 3.4%. Some 300,000 people suffer from a severe visual impairment due to nonoperated cataracts, and 6 of every 10,000 children suffer from blindness due to preventable or curable causes, such as congenital cataracts and glaucoma or premature retinopathy.

**Natural Disasters and Industrial Accidents.** Because of its location in the Pacific "Ring of Fire," Peru is exposed to earthquakes and volcanic events. Eighty percent of the population is considered to be at risk of suffering injury from earthquakes. Lima, Callao, and the southern border—especially Tacna, Ilo, Cuzco, and the Amazon region—are the most vulnerable sites. The country's mountainous terrain experiences frequent landslides. Human settlements in high-risk areas, indiscriminate logging, and mining operations with inadequate planning increase the risk. The National Civil Defense Institute estimates that 35% of the population is exposed to this threat.

## RESPONSE OF THE HEALTH SYSTEM

### National Health Plans and Policies

Although the country continues to face serious social problems, it has achieved the necessary political and economic stability to enable it to formulate medium-term social policies in the framework of State reform. The general objective of the medium-term social policy for the year 2000 is targeting of public spending; the operational goal is reduction of extreme poverty by 50%. In this context, the Basic Social Spending Program is carrying out programs in the areas of

education, health, food, and justice. In the area of health, the Basic Health-for-All Program, launched in 1994, seeks to increase the response capacity of primary care health facilities, beginning with those located in the areas of greatest poverty. In 1996, the budget of the Program represented 21% of the total budget of the Ministry of Health. In 1995 the Ministry defined the following policy guidelines for the health sector for the period 1995–2000: universal access to public and individual health care services, and ensuring that the poorest segments of the population have access to a basic package of health services is a priority; modernization of the sector in terms of technology, management, information systems, and institutional development; restructuring of the functions of financing, service delivery, and control in order to develop competitiveness and improve accessibility and quality; prevention and control of urgent health problems; and promotion of healthy living conditions and lifestyles through sectoral and multisectoral actions.

The General Health Law, enacted in June 1997, assigns to the State the inalienable responsibility of providing public health services and of promoting conditions that will guarantee adequate coverage of services for the population in terms of safety, timeliness, and quality. It defines the delivery of health services as a matter of public interest, regardless of which institution provides them. In addition, the State is responsible for monitoring, preventing, and treating problems of malnutrition, mental health, and environmental health, as well as health problems of underprivileged children, adolescents, mothers, and disabled and elderly persons. The law also envisions that State financing is to be oriented toward public health activities and the partial or full subsidy of medical care for low-income populations who are not covered by any other public or private health care system. Finally, it expresses the will of the State to promote universal and progressive health insurance for the population.

### *Health Sector Reform*

Since 1995 the global restructuring of the State apparatus has been under way, with the primary aim of promoting efficiency in public operations. In the framework of the aforementioned health policies, as well as the restructuring of public functions deriving from State reform, the Ministry of Health has established the following policies for reform of the public health sector: to improve equity in health care by optimizing the allocation, programming, and utilization of resources through the restructuring of health care financing; to develop a user identification system and a basic package of health services as instruments for targeting health spending; to develop governmental capacity in response to the new environment in the public sector at the central and local levels,

as well as the function of regulating the health services market; to improve the administration, management, and quality of public health services through organization of public health facilities in networks at the primary and secondary levels; and to implement a program for modernization of the management of national and regional public hospitals as well as specialized institutions.

While the Ministry of Health will concentrate on the formulation of policies, strategic planning, regulation, and control in the area of health, specialized agencies will be created to oversee the administration of financial resources and of the networks of basic public health care establishments, which will have their own decentralized management. The process of reform has received strong support from international cooperating agencies, especially the projects "Strengthening of Health Services" (IDB), "Peru 2000" (USAID), and "Basic Health and Nutrition" (World Bank).

The Law on Modernization of the Social Security System, enacted in 1997, relaxes the public monopoly on the delivery of medical services to the beneficiaries of IPSS with a view to improving the quality and coverage of services. It also allows beneficiaries the freedom to affiliate themselves with private health care providers, known as health service delivery companies. This process aims to develop the health services market in order to increase coverage for low-income populations, improve the quality of services, and promote efficiency in the allocation of resources.

## Organization of the Health Sector

### *Institutional Organization*

The health sector comprises institutions in the public sector (Ministry of Health, IPSS, the armed forces and police health services, and social welfare agencies), private insurance and providers, and nonprofit institutions. According to the second Census of Physical Infrastructure and Resources of the Health Sector, in 1995 the country had 7,304 health facilities, of which 5,931 (81%) were administered by the Ministry of Health; of these, 134 were hospitals, 1,028 were health centers, and 4,762 were health posts. Given that in 1992 there were 4,630 establishments, these figures reflect an overall increase of 63.4% and an increase of 61.1% in primary-level health facilities in only four years. This growth can be attributed to the large-scale investment program that the country is carrying out, mainly through the Basic Health-for-All Program and the Program for Strengthening of Health Services.

Nationwide, there was 1 bed per 767 population in 1995, an increase with respect to 1992, when there was 1 bed per 835 population. In some areas of the country, however, the ratio is 1 bed per 1,680 population, and in others it is 1 per 220 pop-

ulation. In Lima there is 1 bed per 666 population, and in the rest of the country there is 1 bed per 1,250 population.

Between 1992 and 1996, the availability of physicians increased from 7.6 to 9.8 per 10,000 population, that of nursing personnel from 5.2 to 6.2 per 10,000, and that of dentists from 0.7 to 1.1 per 10,000 population. Although these national averages reflect an acceptable availability of resources, one of the health sector's principal problems is the inequitable distribution of its human resources. The departments with the highest poverty levels generally have the fewest health workers. For example, in Huancavelica, Apurímac, and Cajamarca, the rates of physicians per 10,000 population are 2.8, 2.8, and 3.1, respectively, while in Callao, Lima, and Arequipa, the rates are 22.9, 17.3, and 14.5, respectively. To compensate for this uneven distribution, the Government, through the Basic Health-for-All Program, contracts personnel to serve the population in the most impoverished areas of the country. An important development in the organization and management of health services is the creation of local health administration committees, which are made up of community members and personnel from the health centers and posts. The State transfers financial resources to these committees to hire personnel and pay for other expenses associated with operation of the establishments for which they are responsible. In addition, these committees play an important role in local programming, administration and management of resources, evaluation of services, and assessment of the performance of personnel, as a result of which they have become a key element in the process of decentralization.

Of the population covered by the Ministry of Health in 1993, 31.9% used health services and each user had 2.3 visits; in IPSS, the corresponding figures were 35.9% and 4.3 visits in 1994. A problem affecting the Ministry of Health is that of "overlapping benefits," which occurs when its limited resources are used to care for people who have access to other health care systems. For example, in 1994 the Ministry provided care for 20% of the beneficiaries of the Armed Forces Health Service, 13% of the beneficiaries of the IPSS, and 9.8% of the people covered by private insurance. In addition, some programs are still poorly organized. For example, regular preventive maintenance and upkeep programs still have not been implemented in the Ministry, and in IPSS these programs are centralized. The information on production of services is incomplete, as is epidemiological information; moreover, this information is not always timely or totally compatible between providers, and its dissemination is limited.

### *Utilization and Demand for Health Services*

According to the National Household Survey of 1995, 29% of those interviewed indicated that they had experienced

some symptom of disease or suffered an accident within the 15 days prior to the survey. Of this proportion, 94% had experienced symptoms of disease and 6% had suffered some accident. The proportion of disease symptoms or accidents was greater in women (55%) and in children and older adults (26%). An association was found between low income and likelihood of suffering symptoms of illness (16% in the highest-income quintile reported symptoms of disease, compared with 28% in the lowest-income quintile), while an inverse correlation was found between educational level and illness or accident (69% of those with a primary education had suffered some illness or accident versus only 10% of those with higher education). Fifty-eight percent of the population that reported having experienced some disease symptom or accident failed to seek medical attention (51% of the urban population and 69% of the rural population); in 65% of these cases, the main reason cited was lack of economic resources. The decision to seek medical care was positively correlated with educational level (54% of those with higher education sought care, compared with 40% of those with primary education) and with level of income (56% in the highest-income quintile compared with 29% in the lowest-income quintile). Income level also influenced the type of health personnel and institution from which care was sought: those with a higher income tended to see private providers, while those with a lower income sought care mainly from establishments of the Ministry of Health, pharmacies, and traditional healers. Nevertheless, consultation of pharmacy personnel was a customary practice at all income levels. According to the 1991 and 1994 ENNIV surveys, the participation of the public sector (Ministry of Health and IPSS) and pharmacies as health service providers increased, while that of private clinics and physicians decreased. This phenomenon can be explained by the economic recession that lasted until 1992 as well as rising levels of poverty, underemployment, and unemployment, as a result of which some of the middle-income group that had been served by the private sector undoubtedly began to turn to the public sector for health services.

## Health Services and Resources

### *Organization of Services for Care of the Population*

**Health Promotion.** In Peru, many individual, family, and community health problems are related to unhealthy practices, habits, and behaviors and to the conditions of poverty in which a large percentage of the population lives. For a long time, health promotion and protection were not considered priorities among sector policies. Since 1995, however, in the framework of the health policy guidelines, the Ministry of Health began to stress the promotion of healthy living condi-

tions and lifestyles as a way to improve the population's quality of life. In 1996 the Ministry of Health launched the "Healthy Communities for Sustainable Human Development" initiative, in which community participation and social communication are the principal strategies. The management of adolescent pregnancy, prevention of violence against children, environmental management, and communicable disease prevention have been among the most important activities carried out.

**Epidemiological Surveillance Systems and Public Health Laboratories.** The national epidemiological surveillance system comprises 2,690 health facilities (208 hospitals, 924 health centers, 1,504 health posts, and 54 other facilities), 33 epidemiology departments, and a national office of epidemiology, distributed among the three levels of the Ministry of Health: local, subregional, and central. This system monitors and reports weekly on 15 diseases of importance to public health: cholera, plague, yellow fever, *P. falciparum* malaria, dengue, human rabies, meningococcal meningitis, measles, acute flaccid paralysis, neonatal tetanus, tetanus in adults, diphtheria, whooping cough, AIDS, and epidemic typhus. The country's public health laboratory network includes a national reference laboratory (in Lima) and 11 regional reference laboratories (in Piura, Chiclayo, Cajamarca, Iquitos, Tarapoto, Huancayo, Ayacucho, Cuzco, Arequipa, Tacna, and Puno). The basic functions of the regional laboratories are to carry out serological tests using ELISA and bacterial cultures for diagnosis of communicable diseases. The national laboratory, in addition to these functions, isolates viruses and, in its molecular biology department, performs polymerase chain reaction procedures.

In 1995, not all blood was being screened for the various diseases that can be transmitted through transfusion. The coverage of screening was 60% for HIV, HBsAg, and syphilis and 4% for Chagas' disease. The prevalence of infection in blood banks was 0.28% for HIV, 0.70% for HBsAg, 1.21% for syphilis, and 0.03% for Chagas' disease. Law 26454, enacted in 1994, and its accompanying regulations, which were adopted in 1995, established standards and requirements for the acquisition, donation, transfusion, and supply of human blood. The National Hemotherapy and Blood Bank Program was established within the Ministry of Health in 1996.

**Food Safety.** The country does not have an integrated food safety program. Each sector (agriculture, health, trade, and industry as well as local governments) has food safety standards, which often overlap or leave gaps. In recent years, selling food on the streets has proliferated; there are approximately 60,000 street food vendors in Lima. Many street food stands do not have ready access to sanitary services or a supply of safe drinking water. On average, foodborne diseases ac-

counted for 35% of all communicable diseases reported up to 1990. In 1991, the percentage of foodborne diseases increased to 56.15% because of the cholera outbreak. In 1996 and 1997, several cases of botulism were reported in persons who had consumed canned food that was improperly handled during the canning process.

**Environmental Health.** Environmental management is divided among several sectors. Law 26410 establishes the National Environmental Board as the national regulatory and policy-making body in this area. The National Environmental Board, which is a decentralized agency under the President of the Cabinet, is designed to plan, coordinate, and monitor activities for safeguarding the environment and the country's natural resources. The General Environmental Health Directorate (DIGESA), a division of the Ministry of Health, is the technical agency at the national level responsible for setting standards, evaluating, and coordinating activities with local governments and other sectors in the areas of environmental protection, basic sanitation, food safety, control of zoonoses, and occupational health. The National Institute of Environmental Protection for Health formulates standards and policies on environmental protection. With specific regard to drinking water and sewerage services, the National Water and Sanitation Authority, under the Ministry of the Presidency, is responsible for ensuring the supply of drinking water services, sewerage, storm drainage, and excreta disposal. The Authority is empowered to develop, monitor, and assess the performance of sanitation service providers throughout the country. In addition, the Special National Program on Drinking Water and Sewerage (PRONAP) centralizes most of the investment in water and sanitation. In rural areas, there is no agency within the Ministry of the Presidency that establishes investment policy or investment amounts for sanitation. The main agencies concerned with environmental health in rural areas are the Ministry of Health, the National Compensation and Social Development Fund, the Repopulation Support Program, and PRONAP. Public sanitation services are handled by the *municipios* themselves, which contract or grant concessions to private companies to provide the services.

**Environmental Risks.** Deterioration of water quality is a critical problem in some regions of the country, due basically to pollution by effluents from industrial activities, especially metallurgy, and by domestic and agrochemical waste. In Lima and Callao alone, close to 15 m<sup>3</sup>/s of untreated wastewater is discharged into the sea. However, studies and projects to clean up the coastal area of Lima are being carried out. In addition, the need to implement a water quality surveillance system at the national level has been acknowledged, as has the need for an integrated approach to the problem in which

all productive sectors of the country will be active participants. Work is currently under way to implement this approach in two of the country's river basins (Santa and Rímac). Finally, the Program for Protection of Coastal Areas and Beaches monitors conditions on 70 beaches throughout the country.

Air quality is poor in some areas of the country, including the Lima metropolitan area and industrial areas of Chimbote, Ilo, and Cerro de Pasco. The leading causes of this deterioration are industrial development with inadequate measures to prevent and control pollution and the increase in the size and poor condition of the motor vehicles. Measurements taken throughout 1996 in the center of Lima indicate that the annual average concentration of particulate matter was 270.48  $\mu\text{g}/\text{m}^3$  (allowable limit: 150  $\mu\text{g}/\text{m}^3$ ), and the annual average concentration of nitrogen dioxide was 142.9  $\mu\text{g}/\text{m}^3$  (allowable limit: 100  $\mu\text{g}/\text{m}^3$ ). The levels of lead (0.415  $\mu\text{g}/\text{m}^3$ ) and sulfur dioxide (0.0424 ppm) were within allowable limits (0.5  $\mu\text{g}/\text{m}^3$  and 0.06 ppm, respectively). In Ilo, measurements taken by DIGESA indicate that the concentration of sulfur oxides exceeds the recommended limits set by WHO.

Soil quality also is a problem in several areas of the country. Along the coast, an increase in salinization has occurred as a result of improper use of water and deterioration of forests due to indiscriminate logging and overgrazing by goats. In the mountains, the deterioration in agricultural lands is due to inappropriate farming practices and the consequent destruction of the protective layer of soil on mountain slopes. In the jungle, deforestation is increasing as a result of the clearing for new agricultural lands.

According to the National Household Survey of 1995, 82.4% of the population in extreme poverty occupies dwellings with dirt floors, 56.7% have adobe or mud walls, 31.9% have corrugated metal roofs, and 10% have thatched roofs. In non-poor households, on the other hand, 67.1% of the dwellings have cement, parquet, wood, or tile floor; 51.3% have brick or cement-block walls, and 37% have concrete roofs.

There is no single body charged with monitoring the management of chemical substances from their production to their final disposal; these functions are carried out by various government agencies. However, in 1996 a multisectoral working group was formed to develop a national system for the management of chemical substances. The National Civil Defense System is responsible for organizing emergency response in case of chemical disasters, and the country has a Center for Toxicological Information and a telephone hotline system to ensure continuous availability of information about toxic substances.

**Drinking Water and Sewerage Services.** The country's drinking water supply systems are severely flawed, and, con-

sequently, water is often supplied under poor conditions and the population is forced to get it from other sources. In urban areas, 66.1% of the population is served by household connections to the public water supply system, 8% by connections to the public system outside their dwellings but within the building, 7.7% by public water tanks, 3.7% by wells, 12.1% by tank trucks, and 2.4% obtain water from watercourses. The supply is intermittent in most of the country. Only 8% of the population has water supply 24 hours a day, 73% receives water for 16 to 20 hours daily, 18% for 6 to 15 hours, and 1% for 0 to 5 hours. Of 9,531 water samples analyzed between 1990 and 1996 in several cities of the country, 7,633 (80.1%) had residual chlorine levels higher than 0.1 ppm; of these samples, 3,069 (32.2%) had residual chlorine levels of more than 0.4 ppm. In rural areas, 13.2% of the population is served by public water tanks, 27.3% by wells, 7.0% by tank trucks, and 52.5% get their water out of watercourses. With regard to sewerage, according to the 1995 fourth-quarter National Household Survey (ENAH0-IV95), 47.4% of the population has sewerage service and 21.95% has latrines. In urban areas, close to 66% of the population is served by sewerage systems and about 20% has latrines, while in rural areas about 9% of the population is served by sewerage systems and 24% has latrines.

**Solid Waste Disposal Services.** Although limited information is available on these services, averages have been calculated based on several studies. It is estimated that 48% of the paved roadways in the various localities of the country have street-sweeping services and that between 60% and 65% of the population has refuse collection services. Except in the Lima metropolitan area, which has sanitary landfills, and Piura and Trujillo, which also have some kind of landfill (although they have operational problems), in urban areas solid waste is disposed of in open-air dumps or watercourses. The country does not have adequate systems for the treatment of hospital waste, incineration is very limited and inefficient, and there are no landfills where this hazardous waste can be disposed of safely.

### *Inputs for Health*

The General Department of Drugs and Medicinal Products (DIGEMID), an agency of the Ministry of Health, is responsible for regulation and control of drugs in Peru. In 1994, the value of the pharmaceutical market (factory prices) was estimated at US\$ 60 million for the public sector and US\$ 422 million for the private sector. The process of opening up the market and deregulating prices that has been under way since late 1990 has made a wide range of drugs available. According to DIGEMID, 43% of the 7,447 generic and trademark drugs

on the market in August 1995 were domestic products and 56.7% were foreign products. The Peruvian pharmaceutical industry imports slightly more than 90% of the raw materials for drug manufacturing processes, and the only existing chemical-pharmaceutical company produces two beta-lactam antibiotics that are marketed mainly abroad. In 1992–1993, of 56 laboratories inspected (of 65 registered laboratories), only 25% were complying with good manufacturing practices. Of 312 drugstores and drug importers visited, deficient storage conditions were found in 33%. Street drug sales are a growing problem in the country, and counterfeit and adulterated products sometimes find their way into formal distribution networks.

Peru has been a pioneering country in the implementation of essential drugs programs. The Basic Essential Drugs List was revised most recently in 1992 and is applied today to a limited extent. Since 1994, the country has had a program for shared drug management, which provides a set of 63 low-cost essential drugs to some 1,000 health centers and 4,500 health posts at the primary level of care. The principal strategies of the program are subregional administrative autonomy, administration of revolving funds, and community participation. As of late 1995, the program was operating in all the health subregions, with an approximate coverage of 12 million people and with annual sales amounting to US\$ 12.6 million (in Ministry of Health establishments, drugs are provided free of charge only to indigent patients and to those receiving care under the various disease control programs). In addition, IPSS, with an annual budget of US\$ 50 million for drugs (1996) and some 6 million beneficiaries, has its own drug supply system based on a list that is differentiated by level of care. The practice of generic substitution in the private and public sectors occurs in 35% and 70% of cases, respectively, according to a rapid assessment of the national pharmaceutical situation conducted between October and December 1996. In Ministry of Health establishments the average number of drugs prescribed is 1.9. The average percentage of drugs prescribed by their generic name is 45.6% and the average percentage prescribed from among the drugs included on the Basic Essential Drugs List is 59.6%. Of patients who receive care in physician's offices, 28.2% receive injectable drugs and 49.2% receive antibiotics. The average percentage of a group of 40 essential drugs available in warehouses, hospitals, health centers, and health posts was 65.5%.

### *Health Research*

The sector does not have a defined research policy, although there is a demand for epidemiological and socioeconomic research in connection with the current process of sectoral restructuring. The principal institutions that conducted

research during the period between 1991 and 1996 were non-governmental organizations (58%), public health institutions (30%), universities (5%), the National Institute of Statistics and Information Science (5%), and international cooperating agencies (2%). The fragmentation of research and its limited dissemination, discussion, and application constitute impediments to its use. The Ministry of Health has created a commission that is responsible for proposing research policy within the framework of sectoral reform.

### *Expenditures and Sectoral Financing*

In 1995, total spending on health amounted to 3.6% of the GDP. This percentage has remained stable since 1992. The per capita expenditure on health was US\$ 89. Spending by the Ministry of Health, the *municipios*, and the Public Compensation and Social Development Fund is about 1% of GDP (the per capita expenditure was US\$ 38), while IPSS spending represented 1.3% of GDP (per capita expenditure of US\$ 115). Private expenditure is similar to that of the IPSS: 1.2% of GDP, which is less than in 1992 (1.5%). The health sector's share of public-sector spending rose from 9.9% to 13.1% between 1992 and 1995. The expenditure of the Ministry of Health is slightly greater in the subregions that have the best health indicators, which suggests an inadequate distribution of spending. Although public spending is greater, the proportion of private expenditure is significant. A greater proportion of private spending goes toward the purchase of drugs than toward payment of fees charged by private providers.

The health sector's budgeting and programming procedures are extremely complex, owing to the existence of various sources of financing and budgetary resources for the health subregions. Funding is provided by multiple institutions (various programs and institutions of the Ministry of Health, the Ministry of Economy and Finance, and international cooperating organizations). As a result, the chain of financing is intricate and is not consolidated in overall bud-

gets at the regional level. There is no policy concerning the generation of income by health institutions; rather, criteria differ depending on the type of health facility. This situation engenders inequities, and it hinders the targeting of funds and services to poor populations and the application of cost-effectiveness criteria in rate setting. Several studies have revealed imbalances between the supply and the demand for services, with very low usage rates in many establishments, which suggests the need for restructuring the existing installed capacity.

### *External Technical and Financial Cooperation*

In 1992, based on data from a UNDP report on development cooperation, Peru received foreign aid totaling US\$ 875,871,000, which included a concessionary loan of US\$ 376 million from the Government of Japan for business sector reform; 20.5% came from multilateral sources, 77.9% from bilateral sources, and 1.6% from international non-governmental organizations. The principal sources of foreign aid were Japan (US\$ 474.6 million), the United States of America (US\$ 94.7 million), IDB (US\$ 94.3 million), Italy (US\$ 42.8 million), Canada (US\$ 19.5 million), and the European Union (US\$ 3.9 million). The five areas that received the largest amounts were economic management (54.9%), international trade in goods and services (10.8%), regional development (7.2%), transportation (4.8%), and health (3.9%). In the period 1992–1996, bilateral cooperation accounted for 60% of the external resources received, multilateral cooperation accounted for 35%, and nongovernmental organizations accounted for 5%. In 1993, the Office of Financing, Investment, and International Cooperation of the Ministry of Health formulated the National Program of International Technical Cooperation for the Health Sector, which emphasizes three priority areas: development and strengthening of programs and services, human resources development, and Andean cooperation in health.