
BOLIVIA

GENERAL SITUATION AND TRENDS

Socioeconomic, Political, and Demographic Overview

Bolivia has a land surface of 1,098,581 km², spread over three distinct topographies: highland plateaus (*altiplano*) and Andean mountain slopes (25%), valley area (15%), and plains (60%). In terms of population distribution, 45% of Bolivians live in the highland plateaus, 30% in valley areas, and 25% in the country's eastern plains. Social organization, access to goods and services, and morbidity and mortality profiles vary considerably among the three regions. Although the country is officially divided into nine departments (*departamentos*), regional autonomy is still at an incipient stage.

In 1995, the gross domestic product (GDP) posted growth of 3.7%, the fiscal deficit was cut by 2% of GDP, and the currency issue rate dropped from 36.7% to 20.8%—all in a year. At the same time, however, annual inflation rose from 8.5% to 12.6%, owing mainly to higher international prices for imported staples and local market shortages triggered by the severe drought and its impact on farm output that year. These two factors also had repercussions for the country's trade balance, because imports grew at a faster rate (19.9%) than exports (5.7%). The burden of reform and structural adjustment fell most heavily on Bolivia's poor, and it pushed more people into poverty and out of the socioeconomic mainstream; furthermore, as the peasant farming and mining sectors shrank, activity in the informal sector of the economy expanded.

According to the 1992 National Population and Housing Census, Bolivia had a total population of 6,420,792 that year, estimated to rise to 7,413,834 by 1995. In the period since the previous census (1976), the population had grown at an average annual rate of 2.11% (compared with 2.05% over the 1950–1976 period). The highest rates were observed in Santa Cruz (4.16%), Beni (3.16%), and Tarija (2.82%); Potosí, however, posted a negative rate, with its population shrinking

0.12% annually. People were moving away from the highland plateaus and into the country's central and eastern regions. Overall population density averaged 5.84 inhabitants per km², ranging from 0.6 in Pando to 19.9 in Cochabamba. Life expectancy at birth in 1992 was 61 years for women and 58 years for men. That same year, 57.5% of the population was classified as urban (i.e., living in towns of more than 2,000 inhabitants): three metropolitan areas (La Paz, Santa Cruz, and Cochabamba) were home to 36.2% of Bolivia's population, with 21.3% living in 112 other cities. Children under 15 years of age accounted for 42% of the population, and people over 64, approximately 4%; for urban areas, these figures were 39% and 4%, rising to 44% and 6% in rural areas. Women represented 50.6% of the total population. The total fertility rate was 5 children per woman, more than 1 child less than in the previous decade; the rate ranged from 4.2 children per woman in urban areas to 6.3 for rural women. The indigenous population, estimated at over 3.6 million, encompasses 35 ethnic groups; the Quechua and Aymará are the largest groups, especially in the cities of Potosí, Oruro, Sucre, El Alto, La Paz, and Cochabamba.

In 1992, 70% of Bolivia's 1,322,512 homes lacked adequate access to basic education, health, and housing and were classified as poor (51% of urban homes and 94% of rural homes). Thirty-seven percent of these families lived in conditions of extreme poverty (32% were considered indigent and 5% lived in abject poverty); 13% lived at the poverty threshold, with a minimum level of satisfaction of their basic needs; and only 17% were able to properly meet their basic needs. At the department level, the percentage of poor households ranged from 58% in Santa Cruz to 81% in Pando. The highest poverty levels were found among monolingual indigenous populations and households headed by individuals working in the informal sector. Over 70% of poor households were headed by someone who had not completed primary school. Roughly 70% of children under 9 years of age lived in extremely poor homes and did not attend school. Studies on the

determining factors of poverty indicate that indigenous populations are 40% more likely to be poor; each additional child increases this probability by 6.5% and an unemployed head of household increases it by a further 14%; each additional year of schooling, however, reduces the likelihood of poverty.

According to 1992 census data, 19.8% of the population aged 15 or over was illiterate (11.8% among males and 27.7% among females); this represents a 50% drop with respect to the 1976 census. In rural Bolivia, over one-third of the population (23% of males and 50% of females) was illiterate, with school attendance calculated at 74.3% for children between the ages of 6 and 19 (76.5% for boys and 72.1% for girls); at the primary education level (children aged 6 to 14 years), the rate was 83.9%. Women are gradually assuming a broader role in the country's political and economic life. In the 1993–1997 legislative assembly, women held 3.7% of the seats in the Senate and 7.7% in the Chamber of Deputies. Only 31.6% of university graduates were women. Although their overall participation in the economy reached 39.9%, women earned on average 30% less than men at the same level of employment. Of every five rural landowners, only one was a woman.

Morbidity and Mortality Profile

In 1993, the 10 principal causes of general morbidity were diseases of the respiratory system (22%), intestinal infectious diseases (16%), other infectious and parasitic diseases and delayed effects of parasitic diseases (3%), diseases of the musculoskeletal system and connective tissue (1.6%), diseases of the skin and subcutaneous tissue (1.4%), diseases of the female genital organs (1.4%), diseases of the oral cavity (1.2%), tuberculosis (0.7%), direct obstetric causes (0.4%), and fractures (0.2%). Only 20% of deaths were certified by a health professional.

The principal causes of hospital mortality in 1993 were diseases of the circulatory system (27%), diseases of the digestive system (14%), diseases of the respiratory system (7%), cerebrovascular disease (4%), diseases of the urinary system (3.5%), certain conditions originating in the perinatal period (3%), injuries (2.5%), malignant neoplasms (1.5%), tuberculosis (0.6%), and endocrine and metabolic diseases and disorders of the immune system (0.6%).

Infant mortality decreased from 151 per 1,000 live births in 1976 to 75 per 1,000 in 1992 (based on census data for the two years), a trend that was confirmed by the 1994 National Survey of Population and Health (ENDSA 94). However, the rate in rural areas (94 per 1,000 live births) was approximately 40% higher than in urban areas (58 per 1,000 live births). Diarrhea and acute respiratory infections were the two leading causes of infant mortality. A differential analysis

of infant mortality underscores the gap between rich and poor departments. The rich departments comprise the so-called central corridor (La Paz-Cochabamba-Santa Cruz), and it is here that the country's population and economic activity are concentrated. Tarija and, to a certain extent, Chuquisaca are included in this group, although the latter's socioeconomic situation is more precarious. The mining departments of Oruro and Potosí and the departments of Beni and Pando, located in the Bolivian Amazon, are not included in the group. In the period 1976–1992, the gap between these two groups in terms of infant mortality grew even wider.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Health of Children

According to the ENSDA 94 survey, infant mortality stood at 75 per 1,000 for the period 1990–1994, down from 99 per 1,000 live births in the period 1984–1989. For rural areas, the rate was 92 per 1,000 live births, compared with 60 per 1,000 in urban areas; the rates for the period 1984–1989 were 120 and 80 per 1,000, respectively. Infant mortality was highest in the country's valley regions (101 per 1,000 live births), compared with 96 per 1,000 in the highland plateaus and 53 per 1,000 in the plains. Neonatal mortality was calculated at 41 per 1,000 live births, with a postneonatal rate of 34 per 1,000. Mortality in the group aged 1 to 4 dropped from 57 to 44 per 1,000 over the period in question. Child mortality for the period 1990–1994 stood at 116 per 1,000.

Data from ENSDA 94 indicated that 28% of children under 3 years of age suffered from chronic malnutrition (low height-for-age), a figure 10% lower than that reported in ENSDA 89. One of every three rural children and one of every five urban children suffered from chronic malnutrition, which was more prevalent in the highland plateaus (32%) and valley regions (30%) than in the plains (18%). According to the same source, 15% of children whose mothers had completed an intermediate or higher level of education showed stunted growth, compared with 46% of children whose mothers had no formal education. Acute malnutrition (low weight-for-height) was reported among 4.4% of children under 3, higher than the level recorded by ENSDA 89 (1.6%). The high rates of acute malnutrition in Chuquisaca (14.6%) and Potosí (10%) resulted in a higher national average for 1994.

ENDSA 94 data on prevalence and duration of breast-feeding showed that 22% of children were breast-fed within the first hour after birth and 62% within the first day. Three departments reported low levels of breast-feeding 24 hours after birth: Beni (44%), Pando (44%), and Chuquisaca (51%). A

total of 61% of infants under 2 months of age were exclusively breast-fed; at 4 months of age, that figure was only 25%. At the same time, 80% of children aged 10 to 11 months were still being breast-fed (although not exclusively), and 30% were still being breast-fed at 24 months.

Health of Adolescents

The median age for a woman's first childbirth is 21.2 years. Eighteen percent of all Bolivian females between the ages of 15 and 19 were either pregnant or had already borne a child (the average age at the time of a woman's first delivery is 21.2 years). By age 19, some 37% of Bolivian women are mothers and 9% already have two or more children. Specific fertility rates have declined over the past 30 years for all age groups except the 15-to-19 group (rate unchanged), which, because of its size, has caused the total fertility rate to increase; indeed, it is estimated that, by the year 2000, 13% of all births will occur among adolescents. There is a trend toward initiating sexual activity in early adolescence (currently 2.7% of sexual activity is among people under the age of 15) as well as early initiation of sexual activity (91% of individuals before age 18 in rural areas and 84% in urban areas). Very few female adolescents used family planning methods (5.7%). Adolescent health care—sexual and reproductive health in particular—is very unsatisfactory; as a result of the country's educational reform, however, sexual education is now part of the curriculum.

Health of Adults and the Elderly

According to ENDSA 94, fertility dropped 26% during the previous five years; reproduction rates indicated that women had 4.8 children on average, compared with 6.5 in the early 1970s. Some 62% of women aged 15 to 49 lived in a conjugal relationship, and four-fifths of them were married (matrimony is the most common way of starting life as a couple). Familiarity with contraceptive methods was rather limited, although the situation is improving. In 1994, three of every four women had heard of modern methods of birth control, compared with two of three women in 1989; moreover, 64% said they knew about the pill and intrauterine devices (IUDs), compared with 54% in 1989. Knowledge about sterilization remained unchanged from the 1989 level (54%), although one-half of the women who lived with their partners knew about condoms, compared with 29% in 1989. IUDs were the modern contraceptive method most used in 1994. The use of contraceptives is more prevalent among urban women with higher levels of formal education, especially in the departments of Tarija and Santa Cruz, where roughly

55% of women used contraceptive methods (60% of the methods were modern).

The ENDSA 94 survey data indicated that maternal mortality had remained relatively unchanged: 416 deaths per 100,000 live births in the 1984–1989 period, compared with 390 in the 1990–1994 period. For the highland plateaus, the rate was estimated at 602 per 100,000 live births, more than twice that of the valley regions (293) and almost six times the figure for the plains areas (110). Urban maternal mortality was calculated at 274 per 100,000 live births; the rate among rural mothers was 524 per 100,000, although it reached 887 per 100,000 in the rural highland plateaus. Only one-half of all pregnant women received prenatal care from trained personnel (physician, nurse, nursing auxiliary); 47% received no prenatal care whatsoever. Only 50% of women had been vaccinated against tetanus; in departments in the plains, the area where coverage is highest, the level was only 60%. A high percentage of babies are delivered at home (57%), often without professional care (only 40% of cases). The principal causes of maternal death are, by order of frequency, hemorrhage, toxemia, infection, and obstructed labor; abortions account for an estimated 27% to 35% of maternal deaths.

Persons over age 60 represented 6.1% of the population in 1992, and many of them still worked. The estimated mortality rate among persons over 65 years of age was 7.8 per 100,000 population (8.2 among men and 7.4 among women). There is no explicit government policy on care for the elderly, and health plans and programs for this age group are not assigned priority.

Workers' Health

In 1994, the economically active population (EAP)—defined as all people 10 years of age or older—represented 59% (3,921,236) of the total population; 42% of them worked in the agricultural sector. Women have been increasing their participation in the work force and in 1992 they accounted for 39% of the EAP. An estimated 8% of the EAP is between the ages of 7 and 14. Unemployment oscillates between 9% and 24% of the EAP. Employment activity is not limited to the formal sector; Bolivia's National Statistics Bureau estimates that 1,366,060 people work in the informal sector of the economy. Of the 125,853 economic units identified by the second National Survey of Businesses (1992), 81% had fewer than five employees.

Reliable data on work-related accidents are limited. Of the country's eight existing insurance funds, only the National Health Insurance (which covers approximately 80% of all insured workers) reported data: 1,085 cases of work-related disabilities each year. Among the 15,000 workers exposed to occupational diseases, the most prevalent ones were silicosis

(7.6%) and silicotuberculosis (1.4%). Until the 1980s, when traditional mining activities began to drop off, the reported prevalence among 67,000 exposed workers was around 24%. The occupational hazards of mining and other extractive activities have now been compounded by those of agroindustry and the machine tool, metallurgical, and refining industries (the gas industry, in particular). Specific-risk studies have recorded blood lead levels over the maximum allowable limit among 48.5% of foundry workers and 11.5% of workers at volatile chemical plants; unacceptable urine mercury levels were found among 70.0% of foundry workers; and excessive urine arsenic levels were found among 53.2% of foundry workers and 2.7% of workers at volatile chemical plants. Research conducted between 1989 and 1993 on agricultural workers directly exposed to organophosphorus-containing pesticides revealed blood levels of cholinesterase that were 2.9% below normal in the highland plateaus, 7.0% below normal in valley areas, and 8.8% below normal in the plains.

Only 0.5% of workers in the agricultural subsector of hunting and fishing have health insurance, compared with 30% in the transportation subsector, 55% in construction, 86% to 90% in manufacturing and trade, 90% to 100% in the health and education sectors, and 100% in the banking and financial sector. In economic terms, it has been estimated that the country is losing up to 9.4% of its GDP in direct and indirect costs deriving from work-related injuries. The Labor Act of 1938, which addresses occupational hazards, officially established the principle of worker safety, and Law 16,998 of 1979 assigned responsibilities to the various government agencies and defined the rights and obligations of employers and employees. The Social Security Code outlines standards and socioeconomic arrangements for worker disabilities and mandates the payment of a pension to disabled workers or, in the event of death, to their lawful heirs. The workers' health subsector has undergone a major upheaval since 1997, when the newly created pension fund administrators were charged with managing professional risk up to the year 2001, at which time the law stipulates that specific pension funds are to be in place to provide such management.

Health of Indigenous People

In 1994, a census was carried out in Bolivia's lowlands (i.e., the Oriente, Chaco, and Amazonia regions) aimed at identifying the country's indigenous groups on the basis of language, territory, and self-identity. Three major linguistic groups were identified—the Aymará, the Quechua, and the Guaraní—which are further subdivided into 35 ethnic groups, each with its own cultural identity. It is estimated that nine ethnic groups have died out since the beginning of the twentieth century.

The Aymará group represents 23.5% of the population and is located in the departments of La Paz, Oruro, and Potosí. Infant mortality in La Paz was 106 per 1,000 live births; in the Aymará provinces of the departments of Oruro and Potosí, however, it fluctuated between 120 and 135 per 1,000 live births. Serious to moderate malnutrition among children under 5 years old was higher than the national average in the provinces of Inquisivi, Tamayo, and Omasuyos (department of La Paz). The highest fertility rates (more than seven children per woman) were reported in Tamayo and Villarreal. With the exception of Murillo (La Paz) and Cercado (Oruro), over 10% of the Aymará population used traditional medicine, with that percentage rising to over 30% in the provinces of Tamayo, Camacho, Muñecas, and Aroma in La Paz and in the provinces of San Pedro de Totora, Litoral, and Nor Carangas in Oruro. The proportion of the population with access to Western medicine ranged from 11% to 65%, with the lowest figures being registered in northern La Paz. The areas with the highest percentage of people lacking access to any type of service (over 30%) were situated in the provinces of Los Andes, Pacajes, and Pando in La Paz. Self-medication was found to be most prevalent among the inhabitants of Tamayo, Nor Yungas, and Larecaja (La Paz).

The Quechua account for 34% of the population and they are the group whose health situation is the most precarious: 9 of Bolivia's 10 poorest provinces are located in predominantly Quechua areas; the most seriously disadvantaged groups are found in northern Potosí, western and southern Cochabamba, and in some provinces in Chuquisaca. Of the 36 provinces having Quechua residents, 23 have over 20% monolinguals, a percentage that rises to 60% in Arque (Cochabamba) and 89% in Charcas (Chuquisaca). In 20 of the provinces, the illiteracy rate exceeds 40%, and in 12 provinces over 90% of the population lacks at least one basic service. Child mortality is above the average for rural areas in Iturralde (La Paz); Zudáñez and Azurduy (Chuquisaca); Charcas and Ibáñez (Potosí); and Ayopaya, Bolívar, and Arque (Cochabamba). In some places, child malnutrition is twice the national average. Access to health care services displays patterns similar to the Aymará areas, ranging from 70% in the provinces of Oropeza and Tomás Frías to 11% in Tapacarí. There is a strong preference for traditional medicine, especially in the provinces of northern Potosí (where it is used by 85% of the population in Charcas, 70% in Ibáñez, 69% in Bilbao, and 52% in Chayanta). A similar situation is observed in southern Cochabamba (provinces of Bolívar and Arque), where over 55% of the population opts for traditional medicine; these two provinces also have the highest percentage of people who have no access whatsoever to any type of health service (14% and 20%, respectively).

The Guaraní group comprises 33 different ethnic subgroups spread across the Chaco and Oriente regions, for a total

population of 150,483. The main subgroups are the Chiquitano (47,000), Guaraní (36,900), Mojeño (6,600), and Movima (7,200). Their annual population growth of 1.9% was higher than the 0.1% reported for the general rural population. The fertility rate was 8.5 children per woman, higher than the average for rural areas (6.3 children). Maternal mortality stood at 395 per 100,000 live births, which is lower than the average for rural areas (458). A full 90.5% of the lowland population lacked electricity, 51.2% lacked basic sanitation services, and only 9% had access to drinking water. The overall illiteracy rate was 23%, rising to 30% among females and 37% in rural areas. In the Oriente region, 46.3% of families did not have title to their property, compared with 42.4% in the Chaco and 50% in the Amazonia regions.

These groups are not only highly exposed to communicable diseases, they are also more vulnerable to them. The incidence of tuberculosis was five to eight times greater than the national average, and cholera took a particularly high toll among the Weenhayek (Mataco) and Guaraní communities. Gastrointestinal diseases (acute diarrhea in particular) are the leading cause of death among infants and children under 5 years of age; although these diseases strike with greater frequency and more virulence, they are not deemed a medical priority. Vaccine-preventable diseases (especially neonatal tetanus and measles) are also more prevalent among indigenous children, whose vaccination coverage is lower than for children living in urban areas. Indigenous women, too, are at a significantly greater risk of death, because they start bearing children at a younger age, they have larger families, the intervals between their pregnancies are shorter, they are breastfeeding during a large part of their reproductive lives, they receive inadequate care during delivery, and they have limited access to family-planning services. Furthermore, indigenous women are more submissive and more dependent on men (for cultural reasons) and this leads to higher levels of physical and sexual violence. Such factors, coupled with their greater reproductive risk, place these women in a group that is at high biological and social risk.

Analysis by Type of Disease or Health Impairment

Communicable Diseases

Vector-Borne Diseases. In 1996, a total of 64,012 cases of malaria were reported in eight of Bolivia's nine departments, six of them located in areas at high risk of uninterrupted transmission. Between 1991 and 1996, the annual parasite index rose from 7.0 per 1,000 population (19,031 cases) to 19.4 per 1,000. The number of localities at high risk jumped from 746 in 1993 to 2,124 in 1996, showing increases of between 8.9% and 667%. The departments of Tarija and Beni ac-

counted for 68% of the cases reported. *Plasmodium vivax* was involved in 92% of the cases and *Plasmodium falciparum* in 8%. Cases involving *P. falciparum* had increased significantly, from 1,110 in 1991 to 4,164 in 1996. Chloroquine resistance was encountered in 15% to 45% of cases, mainly in Riberalta and Guayaramerín (Beni) and in certain areas of Pando. Fourteen hospital deaths involving malaria were reported in 1996.

With respect to Chagas' disease, the main vector—*Triatoma infestans*—was present in 60% of the country (six of Bolivia's nine departments). General seroprevalence was estimated at 40%, although it may run as high as 70% in some areas. Infestation indexes for this vector were 70% to 100% in rural areas, 40% to 60% in periurban areas, and 20% to 40% in urban areas. Chagas' disease is estimated to have a mortality rate of 13% among the general population, 29% among men aged 24 to 44, 22% among women aged 24 to 44, and 26% to 46% among children, with 32% of the latter cases attributable to the congenital form of the disease. In 1993, the National Laboratory Institute detected seroprevalences of 5% and 51% at blood banks in La Paz and Santa Cruz, respectively. A seroprevalence of 20.2% was found the following year among 14,200 donors screened by blood banks; in 1995, the level stood at 13.7% for 14,579 blood samples. Among seropositive individuals, 15% to 28% presented with Chagasic myocardopathy and 16% suffered from gastrointestinal disorders. Chagas' disease is estimated to have cut the country's labor capacity by 25%, equivalent to 105,000 years of productive life lost and an economic cost to the country of US\$ 39 million. Bolivia is an active participant in the Southern Cone initiative to eliminate vectoral transmission of *Trypanosoma cruzi* by spraying with residual-action insecticides. Of the 90,000 homes sprayed over the course of the 1990s, 35,000 were sprayed in 1996.

Leishmaniasis is found in tropical and subtropical areas of La Paz, Beni, Pando, Santa Cruz, and Cochabamba. A total of 5,780 cases were reported between 1989 and 1996; of those, 40% (2,310) were reported in 1996; 93.2% were the cutaneous form and 6.8% were the mucous form (the only cases of visceral leishmaniasis were reported in 1993, and even then only in certain valley areas). Men accounted for 65% of all cases, and 75% of those cases occurred in males aged 15 and older. In 1996, only 55.2% of diagnosed patients were treated with a full regimen and proper dosages.

No cases of Bolivian hemorrhagic fever were reported between 1975—the year when seven cases and two deaths were reported in San Joaquín—and 1993, when a case was reported in the province of Mamoré. In 1994, nine cases were reported in the province of Iténez; six of them ended in death. In 1996, there were three nonfatal cases, all in the department of Beni.

Laboratory tests conducted in January 1996 detected the presence of dengue fever in Santa Cruz de la Sierra. The serotypes I and II were in circulation, and a total of 66 cases had been reported as of January 1997. Women accounted for

66% of all cases, with 90% of those cases occurring in females aged 15 and older. No cases of dengue hemorrhagic fever were reported. The infestation index for the *Aedes* mosquito was calculated at 18% in 1996.

Jungle yellow fever continues to be a problem. Starting in 1984, when 12 cases were reported, the disease followed an upward trend that reached 107 cases in 1989, 50 in 1990, and 91 in 1991, only to drop off sharply to 8 cases in 1994. Subsequently, in 1996, 30 cases were reported, pointing to a new upswing in transmission of this disease. The cases occurred in the departments of La Paz, Santa Cruz, Beni, and, in particular, Cochabamba. The disease struck adult males the hardest, producing a 70% case fatality rate. Vaccination campaigns are conducted in areas at risk, usually in response to reports of an outbreak, and protection is provided to military troops stationed in at-risk areas.

In December 1996, there was an outbreak of plague (27 cases) in the town of San Pedro (Apolo, La Paz), with an attack rate of 11%, a case fatality rate of 15%, and general mortality of 2%. Cases were concentrated in the 15-to-49 age group (73%). A blood sample tested positive for *Yersinia pestis*. Actions to control the outbreak included treating individuals with streptomycin and spraying homes with deltamethrin.

Vaccine-Preventable Diseases. The last case of clinically confirmed poliomyelitis in Bolivia was in 1988. In 1994, the last case considered as polio-compatible was seen. Flaccid paralysis in children under 15 years of age was reported at a rate of 2.2 per 100,000 population in 1993, falling to 1.7 in 1994, 1995, and 1996.

Vaccination coverage stood at 81% in 1993, 82% in 1994, 86% in 1995, and 82% in 1996. In 1992, there was a major outbreak of measles, the largest Bolivia had seen in 10 years (4,937 cases). An elimination program was launched and succeeded in raising vaccination coverage to 90% in 1997, ultimately bringing down the number of cases to 16 in 1995 and 4 in 1996 (based on clinical diagnosis).

Neonatal tetanus had declined since the 1992 level of 42 reported cases, with only 14 cases reported in 1996 (0.1 per 1,000 births); between 1992 and 1996, vaccination coverage rose from 52% to 55% among women of child-bearing age and from 77% to 82% among infants under 1 year of age.

Diphtheria dropped from 20 cases in 1992 to 1 case in 1996, and whooping cough fell from 284 cases in 1992 to only 14 in 1996; vaccination coverage now exceeds 80%. A seroprevalence of 1.1% was detected for hepatitis B among 13,276 donors screened at blood banks in 1994, rising to 1.5% based on 13,295 samples screened in 1995.

Cholera and Other Intestinal Infectious Diseases. In 1992, there were 23,862 reported cases of cholera (349 per 100,000 inhabitants), with a case fatality rate of 1.7%; in

1993, 10,290 cases were reported (150 per 100,000 inhabitants), with a case fatality rate of 2.5%; in 1994, 2,718 cases were reported; in 1995, 3,136 cases were reported; and in 1996, 2,632 cases were reported, with a case fatality rate of 2.4%. The highest case fatality rates were observed in remote, rural areas of La Paz and Potosi that lacked easy access to health services. Cholera cases were concentrated in the 15-to-59 age group, with a slightly higher prevalence among males.

The prevalence of diarrheal diseases in children under 3 years of age declined from 36% (ENDSA 89) to 30% (ENDSA 94). An average of five diarrheal episodes were calculated per child per year, and an estimated 7,900 deaths among children under 5 were attributed each year to this cause. The hospital fatality rate for cases involving diarrhea in this age group was 5% in 1992 and 4.8% in 1995.

Chronic Communicable Diseases. Tuberculosis-related care services increased sixfold between 1993 and 1995 and are evidence of the high priority accorded to this disease by the country's health authorities. The number of health care facilities with control programs in place rose from 214 to 1,269 (with government-run services providing 71% of overall coverage). The network of diagnostic laboratories grew from 127 in 1987 to 302 in 1995; the number of diagnostic bacilloscopies performed between 1983 and 1995 quadrupled, going from 18,528 (0.2 per symptomatic patient) to 81,252 (1.3 per symptomatic patient) and, ultimately, in 1996, to a level of 2.8 bacilloscopies per symptomatic patient. Reported cases of tuberculosis (all forms) dropped from 165 to 129 per 100,000 population between 1990 and 1995, with the incidence in 1995 calculated at 116 per 100,000 males and 73 per 100,000 females. Case reports were highest in La Paz, Santa Cruz, and Cochabamba. In the cohort of pulmonary tuberculosis cases treated with directly observed treatment strategy (DOTS), a cure rate of 76% was recorded. Primary resistance was found to be 5.8% for isoniazid, 1.8% for rifampicin, and 4.4% for streptomycin; acquired resistance was reported at 14.7%, 12.6%, and 11.5%, respectively. The case fatality rate of 4.5% had remained stable since 1988.

Leprosy is present in rural areas of Beni, Pando, Santa Cruz, Cochabamba, Chuquisaca, Tarija, and La Paz. Between 1989 and 1996, a total of 3,793 cases were reported (71% were the multibacillary form and 29% were paucibacillary). Eighty-six new cases were detected in 1995, and there were an additional 32 in 1996. All the reported cases involved persons over 15 years of age (60% were males). The case detection rate in 1996 stood at 5 cases per 100,000 population, with a prevalence of 110 per 100,000 population. The country has adopted the use of multidrug therapy.

Acute Respiratory Infections. Acute respiratory infections (ARIs) continue to be the leading cause of morbidity

and the second most common cause of mortality among children. The ratio of ARI mortality to mortality from pneumonia decreased 30% between 1989 and 1994 (dropping from 28% to 20%). According to ENDSA 94 data, 18% of children under 3 years of age had symptoms of ARIs in the two weeks preceding the survey; this percentage was 25% among infants 6 to 11 months old, and 13% for infants under 6 months. The departments of Beni and Pando accounted for 33% of all cases. Estimates from the National Office for the Health and Nutrition of Women and Children indicate that each year some 5,600 children under 5 years of age die from causes attributable to ARIs. The hospital fatality rate from pneumonia in this age group, based on information from the National Health Information System, was 10% in 1992 and 7.2% in 1995.

Rabies and Other Zoonoses. Between 1977 and 1994, a total of 269 cases of human rabies were reported, 71% of them in Santa Cruz and Cochabamba. Eight cases were reported in 1995, and an additional three cases in 1996. Sixty-five percent of the patients were males; 55% were persons under the age of 20. The predominant form of transmission was by dogs (91%). As for animal rabies, 92% of the cases occurred in dogs, 2% in cats, and 6% in other domestic and wild animals.

Tomography studies on teniasis conducted in 1990 at neurological centers in Cochabamba detected 107 cases of neurocysticercosis. In 1995, research on teniasis and cysticercosis in 25 high-risk localities found seroprevalence levels of 12% and 16.4% in Chuquisaca, 7% and 4.7% in Potosí, 1% and 2.5% in Santa Cruz, 8.2% and 3.7% in Tarija, 7% and 7% in Cochabamba, 8% and 3% in La Paz, and 0% (teniasis) and 5.1% to 5.8% (cysticercosis) in Oruro, Cobija, and Trinidad. Parasite disinfection campaigns (with praziquantel) were carried out. Cases of other zoonoses (e.g., fasciolosis and foot-and-mouth disease) were also reported.

AIDS and Other STDs. The first case of AIDS was reported in 1985; as of 1996, a total of 123 cases had been detected in addition to 111 cases of asymptomatic infection with the human immunodeficiency virus (HIV). Ninety-two percent of the cases were in the 15-to-49 age group, and 75% of the patients were males. The means of transmission were sexual contact (92%), blood transfusions (6%), and perinatal transmission (2%). Cases of HIV/AIDS infection were reported in eight of the country's nine departments, although most were concentrated in Santa Cruz, La Paz, and Cochabamba. Blood banks screened 16,093 donors in 1994, detecting a seroprevalence of 0.02%, and 14,227 donors in 1995, detecting a seroprevalence of 0.03%.

The number of reported cases of syphilis (all forms) is on the rise; the rate of incidence per 100,000 population in-

creased from 44 in 1992 to 55 in 1995. In the 20-to-29 age group, 48% of the cases were among women. Blood banks screened 13,334 donors in 1994 and 14,092 in 1995, detecting seroprevalences of 2.4% and 1.3%, respectively. Gonorrhea was observed at a rate of 73 cases per 100,000 population in 1995, compared with 30 per 100,000 in 1992. The age group most affected was 20-to-29-year-olds, with 65% of the cases occurring among males.

Noncommunicable Diseases and Other Health-Related Problems

Nutritional Diseases and Diseases of Metabolism. According to information from the International Fund for Agricultural Development (IFAD), the daily per capita availability of calories showed a gradual downward trend between the periods 1979–1981 and 1986–1988 (dropping from 2,082 to 1,987 kcal per day). Data for 1994 showed a level of 2,115 kcal per person per day. Studies undertaken in 1994 and 1996 by a committee of experts (the International Council for the Control of Iodine Deficiency Disorders) revealed a level of iodized salt consumption calculated at 91.6%, average levels of urinary iodine among the general population at 25.02 µg/dl, and 4.5% prevalence of goiter in schoolchildren. With regard to vitamin A deficiency, a 1991 study of 979 children between the ages of 12 and 71 months found serum retinol levels to be below 20 µg/dl in 11.3% of the cases (19.5% in rural areas of the highland plateaus and 16.5% in the plains area) and below 30 µg/dl in 48.3% of the cases (marginal or subclinical deficiency). Vitamin A deficiency has been targeted under the Expanded Programme on Immunization (EPI) by means of campaigns promoting the administration of capsules containing 200,000 international units of this vitamin. A 1992 study by the Bolivian Institute for High-Altitude Biology focusing on highland children between the ages of 6 months and 9 years showed a prevalence of iron deficiency (as manifested by the presence of nutritional anemia) ranging from 14.6% to 42.6% at an altitude of 3,600 m above sea level and from 23.3% to 67.2% at 4,800 m above sea level; the prevalence of anemia was found to decrease with age.

Domestic Violence. In one 12-month period (1992–1993), Bolivia's four largest cities recorded 21,500 official reports of violence against women, 73% of which involved domestic violence. In almost all cases, the aggressor was a male (a companion or former companion of the woman); the forms of violence were classified as physical (48% of cases), psychological and other (42%), and sexual (10%). Since 1994, the Undersecretariat for Gender Affairs has been overseeing implementation of the National Plan for the Prevention and Eradication of Violence against Women, and in December 1995 the National

Congress passed the Domestic Violence Act. A network of legal support and family protection services has been set up in the country's main cities. The fact that the number of reported cases of family violence has increased since 1996 is attributable to greater public awareness and mobilization in this area. Given the delicate nature of the issue of sexual abuse, available data do not always reflect the true situation of sexual abuse of children and adolescents. According to the Undersecretariat for Gender Affairs, of every 10 women who were victims of violence in Santa Cruz, at least 2 of them had been raped; in Cochabamba, at least 1 had been a victim of rape.

Oral Health. In June 1995, the then National Health Secretariat conducted a study of 2,666 children between the ages of 6 and 15 in 128 periurban and rural schools; the study revealed an overall index of decayed, missing, or filled teeth (the DMFT index) of 7.6 (9.5 for 6-to-9-year olds and 6.9 for 6-to-15-year olds). The DMFT index for children from families considered to be moderately poor was 4.5 in valley areas, 7.3 in the highland plateaus, and 10.9 in the plains. The average fluoride content of the water supply—at 0.29 ppm—was below the recommended level. A ministerial resolution was subsequently signed attaching high priority to this issue and launching a salt fluoridation program.

RESPONSE OF THE HEALTH SYSTEM

National Health Plans and Policies

The Government of Bolivia has responded to the country's health situation by passing the Community Involvement Act (*Ley de Participación Popular*, April 1994). The act transfers ownership of all local service infrastructure to the *municipios*, allocates funding for this purpose (which would now be apportioned on a population or per capita basis rather than discretionally), and delegates to them all responsibility for the operation, maintenance, and administration of that infrastructure. Under the legislation, the *municipios* are granted full title to all revenue generated by the sale of such services; they are also required to formulate social and economic development plans (for health actions as well) under a participatory approach that involves the user population. Lastly, the act created a supervisory committee that would be responsible for overseeing activities and the appropriate use of funds. Human resources and countrywide programs would continue to be financed out of the national budget. Subsequent legislation (the Administrative Decentralization Act) transferred human resource administration to the local government level (*prefectura*) of each department, although funding would continue to come from the national budget.

The then National Health Secretariat that had become part of the Ministry of Human Development devised a national health model that was intended to help the health sector adapt to the recent legislative developments. Approved in 1996, this new model provided the legal framework for restructuring the health sector. It defined the public health system as a decentralized, participatory structure that served as both the sector's response to and its instrument for policy and for technical, administrative, and citizens' concerns in the face of the current situation of poverty and health. At the conceptual level, the model framed health policies and plans against the broader backdrop of human development and called for greater coordination between health and education actions, giving due consideration to variables such as gender, ethnic heritage, age, degree of urban development, and the fight against poverty. At an operational level, the model outlined a structure and organization for the national health system, sector management arrangements, and the responsibilities of the various social participants in the production of health.

Organization of the Health Sector

Institutional Organization

Under the model described above, the national health system comprised all public and private services that are engaged in health-related activities under the aegis of the then National Health Secretariat; these include the public health system, the social security system, private for-profit and not-for-profit entities, religious groups, and traditional medicine.

In 1998, the Ministry of Health and Social Welfare designed a new health model that defines the Bolivian Health System as a universal access system based on primary care and embracing gender and intercultural approaches. In terms of operations, the new model establishes care, management, and financial modalities. The Bolivian Health System is defined as accessible, efficient, and solidary and having sustainable quality and multiple providers.

Public Health System. The public health system is a decentralized, participatory system that is funded out of the national budget. Its mission is to provide health care and respond to the population's health needs while observing criteria of universal access, solidarity, and efficiency. The system is essentially a network of services that are administered locally and jointly by the community and by the department and *municipio* governments. This network is organized into three care levels. The first level is formed by the country's 896 health centers and 1,210 health posts, which provide a total of 2,276 beds for attending to normal deliveries and emergency hospitalization;

traditional medicine is included in this level. Basic hospitalization services and specialized consultations make up the second level, represented by 63 district hospitals (a total of 1,717 beds). The third level—highly specialized consultations and hospital care—is made up of the country's 81 general hospitals (5,277 beds), 29 specialized hospitals (including social security facilities and psychiatric hospitals, for a total of 2,071 beds), and national reference and technical support centers.

Health promotion, preventive and curative care, and rehabilitation services are provided throughout the network and at all levels, in accordance with each level's ability to respond to the community's health care needs and the programs and strategies defined locally as part of the participatory planning and programming process.

The system basically has two kinds of management arrangements: management by sector institutions and management that is exercised jointly with the local community. Management by sector institutions refers to the administration of all actions involved in the definition and administration of policies, plans, and programs for the delivery of health care services. Jointly exercised management refers to the responsibilities assumed in cooperation with the local community to administer health care services in a given *municipio*. This kind of management is performed through the local health boards, which provide a locus for consensus building, negotiation, and coordination with an eye to the smooth development and operation of the municipal health system. The health boards are overseen by the local level of government (which provides infrastructure and operational support) and are made up of a sector representative (from the office of the *prefecto*, which provides the human resources) and a representative of the users or the organized community (who provide community monitoring and contribute to the overall financing of the local health system through payment of fees, whence the need for shared management).

Nongovernmental organizations (NGOs) and the churches in the country play a significant role in health care delivery. At the national level, a broad-based agreement has been signed by the Ministry of Finance and the National Health Secretariat; at the local level, specific agreements are signed with each local health board allowing NGOs to work directly with local governments.

Traditional-medicine practitioners are allowed to practice at health care establishments or at the *municipio* level; they also are authorized to set up practice independently in the private sector. There are no legal restrictions on the practice of traditional medicine, and the local health boards are permitted to use these practitioners in the public care network, which in fact occurs in the case of midwives. This notwithstanding, their integration into the public network has not been smooth. Surveys reveal that the public sector provides health care for about 40% of the national population.

Health Insurance. Aside from the coverage provided by the public sector per se, Bolivia has an additional health insurance scheme that covers hourly workers. These "insurance funds" (*cajas de salud*), however, are separate from the pension plans, even though they are tied in to conventional social security financing arrangements. The funds currently provide coverage to 20% of the population, but their growth has been very slow or even negative in recent years. There are eight health insurance funds and two special, comprehensive insurance funds; benefits and quality of care vary from one to the next. The largest of these funds is the National Health Insurance, which provides 85% of the country's social security coverage and whose principal guarantor is the Republic of Bolivia. These health insurance schemes do not cover informal, self-employed, or migrant workers, nor do they cover peasant farmers, operators of for-hire vehicles, housewives, domestic workers, miners who are members of cooperatives, or employees of small businesses; all these people must be covered by the public subsector. Ambulatory care is provided at the outpatient services of hospitals and clinics run by the various funds. This subsector is essentially self-governing, although its activity is coordinated by a unit of the National Health Secretariat and by the National Health Insurance Institute, which performs oversight and policy-setting functions. It has an extensive service network of some 9,300 employees and possesses suitable technological capacity. The subsector focuses on hospital care and on the urban population (only 4% of the rural population is covered), it is relatively inactive in the area of health promotion, and it lacks arrangements for user participation in management and planning.

Private Subsector. This subsector is made up of for-profit and nonprofit, privately run companies and organizations that have their own funding. It is regulated by the National Health Secretariat and other government authorities and agencies, who make sure that services are safe and efficient and that qualified personnel are employed. The private subsector comprises:

- Private firms, such as health care providers and suppliers of inputs, diagnostic support services, and drugs. Although the private subsector is perceived to operate efficiently, only 10% of the population is thought to use its services regularly. The subsector is experiencing significant growth in urban areas and is able to respond well to the socioeconomic conditions of the neighborhoods where it operates. Even so, private medicine has yet to be taken into account in the planning and organization of the health system, and oversight of the subsector continues to be weak. Some of these services are consumed by the health insurance funds, although a large portion are, in essence, subsidized by the public sector, because private care providers use the public sector's infrastructure.

- Nonprofit organizations. NGOs are the main participants in this category; there are many of them in Bolivia and their presence locally depends on the area and poverty level of the *municipio*, as well as on the churches' activity. Many conduct health promotion activities, and some provide health care services directly, under agreements with the *municipios*; yet others focus on helping the *municipios* and existing services to strengthen their management capacity and organization (e.g., Medicus Mundi, Doctors Without Borders, and Plan Internacional). An association of health-related NGOs has been set up to coordinate the work of local and international NGOs in this sphere. Most receive international funding, with very few benefiting from local financing. The majority of these NGOs work in depressed urban areas; a few, mainly those with international financing, are active in extremely poor *municipios*. NGOs are gradually being incorporated into the public health insurance system and into the revamped structure of the new health model. An estimated 10% of the national population uses these services, chiefly at the primary care level; for health promotion activities, the figure is much higher.

Churches provide important services to the community, especially in areas of extreme poverty and in marginal urban areas. In most cases, work is organized around government-sponsored human resources, the churches' infrastructure, and partial financing by users. The churches' work in some departments has helped to set up service networks that include all three care levels, usually in combination with health promotion activities. In some *municipios* and communities, the churches are the sole service providers.

- Traditional medicine is practiced widely, and almost every rural or marginal urban community has some kind of practitioner (e.g., midwives, traditional healers, etc.). The health system is gradually moving to incorporate traditional midwives into local care networks. Demand for these services is high and they are often used in conjunction with other public and private services. Some of the Western-style care providers who also practice traditional medicine have formed an association (SOBOMETRA), and their establishments have been gaining acceptance around the country. An estimated 20% to 30% of the population has serious difficulties in accessing formal public and private health care services, because of either a shortage of such services or their inaccessibility for cultural, economic, geographic, or functional reasons. These are the people who turn to self-treatment and traditional medicine. Against such a backdrop, the inauguration of national insurance for mothers and children in July 1996 was a major milestone; coverage is provided for ambulatory care; medical, surgical, and pharmaceutical assistance; basic laboratory services; hospital care during pregnancy, delivery, and puerperium; obstetric emergencies; and medical,

pharmaceutical, and hospital care in cases of acute diarrheal diseases or ARIs, including pneumonia in newborns and children under 5 years old. The plan is funded out of the 3% transferred to the municipal governments under the country's revenue-sharing arrangements. Another milestone was establishment of the national old-age insurance scheme (financed with earnings from the national charity lottery), which provides access to care at no cost to persons aged 65 and older.

Health Services and Resources

Organization of Services for Care of the Population

Water Supply and Sewerage Systems. Services in this sector fall within the sphere of the National Basic Sanitation Directorate, which is the agency in charge of coordinating the supply of basic sanitation services with the local governments and service providers. Between 1993 and 1995, water supply coverage rose 6.4% and sewerage coverage 2.8%; in 1996, the levels stood at 58.2% and 44.5% respectively, dropping to 24% and 17% in rural areas. The Basic Rural Environmental Sanitation Program, with support from the World Bank, the United Nations, and PAHO/WHO, hopes to close these gaps by promoting community participation at the municipal level.

Hospital and Municipal Solid-Waste Management. Considerable progress has been made in this area since 1992. As of 1996, seven of the nine major cities had effective solid waste collection and disposal services; coverage at the national level was 60%. In 1997, a second phase of activity was launched in seven medium-sized cities, which brought coverage up to 70%; service coverage for the scattered rural population is the principal challenge remaining. Plans are to greatly expand coverage by the year 2010 by means of self-sustaining microenterprises that have been trained in solid waste management. With regard to hospital waste, a pilot project has been implemented at a number of tertiary-level hospitals with support from international technical cooperation; the project is now slated for upscaling to the national level.

Prevention and Control of Air Pollution. Programs to control fixed-point and mobile-source emissions have been launched with a view to bettering air quality in two major cities. In 1994, Bolivia enacted Law 1,484, which adhered to international agreements for protecting the ozone layer; in 1996 the Governmental Ozone-Protection Commission was created, and a nationwide calendar was adopted for mandatory phasing-out of chlorofluorocarbon use.

Environmental Risks

Water. Several major watersheds continue to register high pollution levels, and only four major cities have wastewater treatment plants (in the past four years, only one new treatment plant was opened). Industries—mining concerns in particular—do not exercise adequate control over the materials they discharge into waterways and, accordingly, there is a high risk of chemical contamination, especially with heavy metals and especially in the departments of La Paz, Oruro, and Potosí. The Porco incident—240,000 tons of mining waste that spilled into the Pilcomayo River when a dike broke—is a dramatic example of the risk that water contamination poses to the population's health and the ecological damage that can be wrought. Panning for gold has led to mercury contamination in rivers throughout most of Pando, Beni, and La Paz, and it could affect the health of area residents who eat contaminated fish. Similarly, the waste dumped from sugar mills in Santa Cruz has been polluting rivers and destroying local flora and fauna.

Air. Fixed-point emissions of metallic dusts and gases contribute to high air pollution indexes in mining areas, especially around foundries in Potosí, Oruro, and La Paz (El Alto). Studies of children in Oruro and El Alto have found blood arsenic and lead levels three to four times higher than the allowable limit. Significant amounts of lead are emitted by mobile sources (e.g., from gasoline) and contribute to the problem of air pollution in urban areas.

Soil. Commercial logging activities in the warm valleys of La Paz and the *chapare* area of Cochabamba have left extensive tracts of former forestland bare, and other forest areas have been burned down to clear land for agricultural use. These practices have triggered a serious ecological imbalance that threatens the survival of various species of local flora and fauna. In the department of Tarija, deforestation coupled with drought and strong winds has led to soil erosion and destroyed a unique ecosystem, converting it into desert. A similar phenomenon is being observed in the warm valleys as a consequence of intensive coca cultivation, a practice that depletes the soil's nutrients and reduces its productive capacity. The heavy rains that flooded several areas of the country in 1997 resulted in a national emergency that had repercussions for some 77,330 persons.

Housing. According to the National Fund for Low-Income Housing, 40% of the Bolivian population lacks access to housing. Approximately US\$ 80 million is being invested in the construction of 35,000 homes in different areas of the country, especially in medium-sized cities and department seats. To solve the quantitative housing deficit, though, some

200,000 homes would need to be built each year, and an estimated half a million existing homes are in need of qualitative improvements. Electricity is available in 87% of urban dwellings (68% in Beni, 90% in Potosí and Oruro) but only 15% of rural dwellings (6% in Chuquisaca, 23% in Cochabamba).

Chemical Safety. Bolivia is drawing up a national profile of chemical substances and preparing a project entitled "*Sustancias Químicas Bolivia*" (Chemicals Bolivia). Consideration is being given to legislation that would control the importation, transport, storage, and use of chemicals, and negotiations are under way for Bolivia to join the International Network of Chemical Substances.

Food Protection and Control. Food surveillance and control is performed at the production, handling, transportation, and storage stages. Any foodstuff that is made available to the public is subject to monitoring by the local Municipal Sanitation Directorate and by the National Health Secretariat's Food Control Directorate. The central level maintains a national registry of foods processed in the country and a registry of authorized food importers, and it grants authorization for the sale of imported processed foodstuffs.

Surveillance of Foodborne Diseases. The VETA project has been providing stepped-up epidemiological surveillance of foodborne diseases since January 1996 in the departments of Santa Cruz, Cochabamba, Potosí, and La Paz. As the policy-setting body in this sphere, the Office for Food Control is represented on the Technical Standards Committee of the National Industry Secretariat and the Bolivian *Codex Alimentarius* Committee; it is also the focal point for the subcommittee on food safety. As of 1996, the National Registry contained 3,855 listed food products and 850 controlled products (importation, registry, and follow-up).

Organization and Operation of Personal Health Care Services

As of 1996, Bolivia had 2,279 registered health care establishments (2,007 of them operated by the National Health Secretariat, NGOs, or the churches, and 272 operated by the social security system) and a total of 11,939 beds (8,503 and 3,436 respectively), averaging out to 3,291 persons per establishment and 1.6 beds per 1,000 population. The occupancy rate of 41.1% is a clear indicator that hospital services (i.e., the ones that use the most resources) are underutilized. According to 1995 data from the National Health Information System, 56.1% of the total of 4,764,742 outpatient consultations were performed by the public subsector, 24.3% by the social security system, 10.8% by health NGOs, 6.9% by

church-affiliated services, and 2.0% by the private sector that reports. In terms of sector output, this comes to 0.63 consultation per person per year. Deliveries attended by qualified personnel had a coverage level of 35.5%. Prenatal care coverage (i.e., a series of four checkups) was calculated at 26.9%; the average was 1.97 consultations per pregnancy. Of the 434,546 prenatal checkups performed, 63.0% were done at public sector facilities, 16.8% at social security establishments, 11.8% by NGOs, 6.5% by church-affiliated services, and 1.9% by private sector providers. According to the same source, only 46% of the population had first-time contact with the public health system during the year. As for hospital discharges, in 1995 the National Health Information System recorded 2.8 discharges per 100 population nationwide (ranging from 1.5 in Cochabamba to 5.4 in Beni), an average stay of 5.8 days per bed, and an occupancy rate of 46%.

The public sector's emergency services are in need of greater operating capacity and more modern and expeditious systems for communications and transportation. La Paz and Santa Cruz are the only two cities to have implemented the Dial-118 emergency telephone line, which has been handling calls and transportation for medical emergencies since 1996. A similar service is run by the police department (Dial 110).

Diagnostic and therapeutic support services are present at most secondary and tertiary level hospitals, but they are relatively rare in rural areas. According to the National Health Secretariat, Bolivia had 224 working laboratories in 1997. In 1995, a total of 1,322,096 laboratory tests were performed; 40 public sector and 20 private hemotherapy services were registered, bringing donor totals to 15,743 public sector and 6,403 private donors; and 20,451 blood transfusions were performed (compared with 18,991 in 1994).

Regarding oral health, there were 355,971 first-time consultations and 220,390 follow-up visits in 1996, with 266,339 extractions and 158,127 fillings performed. A total of 5,735 children under 5 years of age received follow-up fluoride applications; and 47,486 dental surgical procedures were performed.

Inputs for Health

Essential Drugs and Medications. There is inequitable access and inefficient use of essential drugs and medications, which has led to the marketing of drugs that are not only more costly but are of doubtful efficacy and safety. With total annual sales of roughly US\$ 70 million (US\$ 10 per capita), the pharmaceutical market is supplied by 26 local manufacturers (40%) and by importers (60%). The market is very concentrated: three large laboratories cover about 40% of the domestic market. The National Program for Essential Drugs was launched in 1990, and efforts are under way to strengthen

the regulatory framework, shore up the supply of low-cost essential drugs, enhance quality, and promote the rational use of drugs. In the service network, drugs are purchased directly by patients and health establishments.

Bolivia is an active participant in the Expanded Program on Immunization and, accordingly, is able to purchase vaccines of proven effectiveness at stable, affordable prices. The national budget has made the necessary allocations for the purchase of EPI inputs since 1995. Several vaccines, such as those for rabies and malaria, are supplied by friendly governments at low prices or, in some cases, at no cost. EPI vaccinations are administered free of charge throughout the public health services network. Most medical and surgical inputs are procured directly by health establishments from private sources or from NGOs; financing for such purchases comes directly from cost-recovery measures (fees) or local government allocations.

Human Resources

According to 1992 census data, the allied health professions had an economically active population of 25,229 (10,287 men and 14,942 women); 24,872 persons were employed and 357 were unemployed. Of the total staff employed in the public health subsector (21,373), 12,056 worked in the decentralized public subsector and 9,317 in the autonomous public subsector, distributed as follows: 4,011 physicians (1,976 under the National Health Secretariat and 2,035 in the social security system), 1,894 nurses (1,003 and 891), 4,792 nursing auxiliaries (3,134 and 1,658), and 10,541 administrative and support staff (5,808 and 4,733). These resources were concentrated in the country's economic development corridor (La Paz, Cochabamba, and Santa Cruz); roughly 80% of the country's specialists worked in tertiary-level facilities located in cities. With the passage of the 1996 Administrative Decentralization Act, staff was transferred to the local government level (*prefecturas*), and guidelines were drafted for the reorganization of personnel departments and chains of command; however, municipal health service networks are only now being reorganized and staff reassigned. Twenty percent of Bolivia's 311 *municipios* lack qualified health personnel; in those *municipios*, health care is provided by lay staff. Training has been provided to midwives, health promoters, and other community resources over the past 20 years with an eye to meeting the population's health demands; over 5,000 of these trained midwives and health promoters are thought to be active in the health system.

Training opportunities for health personnel have expanded dramatically with the founding of private universities. The supply of undergraduate courses in medicine has tripled over the past six years; for nursing and dentistry it has doubled.

Rural areas continue to be at a disadvantage, not only because of the lack of permanent positions, but because of the dire shortage of basic and intermediate-level technical staff; indeed, there are no human resource management systems or policies in place to boost productivity and keep health care personnel in areas where they are needed, nor are there any arrangements for in-service training. Between 1991 and 1995, 766 new positions were created for physicians, compared with only 111 new positions for professional nurses; this phenomenon is especially noticeable in the social security sphere. The system's bias toward medical care is evident in the supply of training: most undergraduate programs tend to focus on hospital practice, with public health programs receiving considerably less attention. The Government has sought to address this issue by means of the health care teaching committees that it set up in 1993. High levels of staff turnover, however, have resulted in more than 50% of the trained personnel being lost in less than two years.

Expenditures and Sectoral Financing

The main sources of funding for Bolivia's health sector are:

- The National Treasury. The National Health Secretariat executed a budget of US\$ 99 million in 1995. Of that amount, US\$ 57 million went directly to health care services (equivalent to 4.1% of the national budget), with the remaining US\$ 42 million going toward transfers, pensions, and retirement fund payments. The National Treasury allocated an additional US\$ 83,000 to health spending for the purchase of drugs under the Ministry of Defense's *Sanidad Operativa* initiative. Funds earmarked for payroll were transferred to the local departmental governments (*prefecturas*) in June 1995 as part of government decentralization. Despite a series of constraints stemming from recent structural adjustments (revenue sharing, foreign debt service, transfers to projects), the national budget's share in financing personnel costs actually increased 18% between 1993 and 1996.

- The *municipios*. As of 1994, the Community Involvement Act transferred ownership of all physical infrastructure for health, education, culture, sports, irrigation, microenterprise irrigation arrangements, and rural roads to the *municipios*, along with the responsibility to administer and maintain them, outfit them with the necessary installations and supplies, build new infrastructure as required, and oversee the respective service providers. Of Bolivia's 311 *municipios*, 219 have qualified to receive funds under national revenue-sharing arrangements; the other 92, which have populations smaller than the requisite 5,000, have joined together to form 47 legally recognized pairings or groupings of municipalities in order to receive revenue-sharing entitlements. In 1994, the

municipios' revenue share outs came to US\$ 74 million. Starting in 1995, these funds have been allocated according to strictly population-based criteria; in that year, the budget allocation came to US\$ 141 million. Of the total funds transferred under the revenue-sharing arrangement, the amount earmarked for health in 1994 was US\$ 2 million (2.7%), rising to US\$ 8 million in 1995 (5.7%); for 1996 the amount was estimated at between 6% and 10%. Some *municipios*, such as Capinota and Tupiza, have invested up to 30% of their revenue in the health sector. All income from service fees and other cost-recovery measures belongs to the *municipio* and is ploughed back into supporting the operation of the services. This contribution is considered under the heading of private family health spending: families pay a fee to the decentralized public sector, which pays for drugs and inputs for diagnosis, treatment, or maintenance of the services.

- Companies. Health sector financing from this source is limited to legally established public and private companies that contribute to the social security system (short-term benefits). Applicable legislation stipulates that this contribution (calculated at 10% of payroll) is to be borne exclusively by the employer. In 1995, the amount furnished under this category came to an aggregated US\$ 107 million (including the resources from the military's separate social security fund), equivalent to an annual average contribution of US\$ 312 per premium-paying insured individual and US\$ 69 per covered beneficiary. The total sum available for covering health care needs was around US\$ 6 million, equivalent to US\$ 106 per beneficiary.

- Families. Data on the health spending of Bolivian families are very limited. According to a 1990 survey of family budgets conducted in the cities of La Paz, Cochabamba, Santa Cruz, and El Alto, health spending (for all subsectors of service providers) represented 4% of the household's overall expenditures, ranging from 2.4% in the poorest quintile to 4.9% in the richest one. Forty percent of health spending went toward the purchase of drugs, and service fees accounted for the other 60%. This category was estimated at a total of US\$ 105 million.

- External cooperation. Available data on external financing indicate that the total contribution from this source stood at around US\$ 312 million for the period 1989–1995; budget execution averaged US\$ 28 million per year, or 63% of the overall amount committed to the health sector. As a rule, external cooperation has focused on infrastructure, equipment, development of national programs, and support for municipal health development efforts, and it has thus helped to enhance equity in the system.

- NGOs. There are 141 NGOs working in the Bolivian health sector according to the country's consolidated registry of NGOs. A 1994 survey of 63 of these NGOs revealed a combined investment of US\$ 9 million from outside sources. The aggregate amount invested by this category is estimated at US\$ 20 million.

Factoring together all the contributions from the various subsectors, the country's total health sector expenditure was reckoned at US\$ 323 million for 1995 (4.7% of GDP), equivalent to an annual per capita spending of US\$ 44. The main source of financing for national health spending was social security (35%), followed by family contributions (32%), the National Treasury (15%), external cooperation (15%), and, lastly, the *municipios* (3%). If external cooperation is removed from the equation, the total comes to US\$ 275 million per year (4% of GDP), equivalent to US\$ 37.50 per capita. The public sector's spending on health (from the National Treasury, *municipios*, and company contributions to social security) came to US\$ 170 million (2.5% of GDP), equivalent to US\$ 23 per capita.

As can be seen, financing for the health sector has been relatively stable. The prospects for any substantial increase in this area are directly proportional to the funding sources' ability to increase their contributions, be it from families, companies, or the government (at both the national and *municipio* levels). That said, there are some yawning inequities in the current financing situation; social security spending, for instance, accounts for 35% of the total although it covers less than 20% of the population. Steps to close these gaps will need to include a redistribution of sector financing and broadened coverage of the social security system.

External Technical and Financial Cooperation

The past four years have seen a marked increase in technical cooperation between countries, not just in the Andean Subregion and Southern Cone but with other countries in the Region as well. Technical and scientific exchanges were carried

out with Argentina, Brazil, Colombia, Costa Rica, Cuba, the Dominican Republic, Mexico, and Peru. The countries pooled efforts in a vast array of fields: epidemiology, traditional medicine, food control, vector control, blood banks, hospital administration, health service maintenance, disaster prevention and mitigation, salt fluoridation, organization of oncology services, plastic surgery and burn treatment, exchanges between pediatric associations, improvement of housing, basic sanitation and water supply, actions at the *municipio* level, health development activities in border areas, and exchanges among traditional midwives. Technical cooperation activities were carried out with the participation of the National Health Secretariat, the academic community, the National Oil-and-Gas and Health Funds, and the Agriculture Secretariat.

Funding from external cooperation sources falls into two broad categories—official (both multilateral and bilateral) and nongovernmental. In the health sector, this cooperation is provided under one of two formats: grants or loans. Bolivia has extensive bilateral cooperation arrangements with partners such as the European Economic Community, the United States of America, Japan, and the Scandinavian countries, and it also receives significant cooperation from the United Nations System (PAHO, UNICEF, the World Food Programme, the United Nations Population Fund, United Nations Volunteers) and other agencies. The multilateral development banks (the World Bank and the Inter-American Development Bank) also are lending support to crucial projects to strengthen the country's service network and health care programs. This category breaks down as follows: 65% in bilateral aid, 20% in technical multilateral aid from the United Nations System, and 15% in aid from development banks. International NGOs, it should be noted, account for a sizable share of technical and financial cooperation in some *municipios*.