

# BOLIVIA



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

**B**olivia shares borders with Brazil, Paraguay, Argentina, Chile, and Peru. It covers an area of 1,098,581 km<sup>2</sup>, 65% of which is plains, where 26% of the population lives; the Andean valleys occupy 19% of the surface area, with 29% of the population; and 16% is occupied by highlands plateau (the altiplano), with 45% of the population (1).

## GENERAL CONTEXT AND HEALTH DETERMINANTS

### Social, Political, and Economic Determinants

The 2001 census showed that 64% of the total population did not have sufficient income to cover basic needs. According to 2005 projections from the Economic and Social Policy Analysis Unit, the estimated population living in poverty in 2006 would be 5.9 million people (63%) (2) and of this group, 2.0 million (35%) would be living in extreme poverty (3). This population was concentrated in municipalities of the high Andean valleys and altiplano and was mainly of indigenous descent. The plains area, El Chaco region, and the largest Bolivian cities also have significant levels of poverty, due to migration. In 2002, the estimated Gini index was 0.614 (4).

In 2000, the government administration then in office established the Bolivian Poverty Reduction Strategy. This Strategy was implemented following a highly participative national dialogue in which civil society determined areas of intervention where available resources could be applied to reduce the levels of extreme poverty. The objective of the Heavily Indebted Poor Countries (HIPC) initiative—a joint effort of the World Bank and the International Monetary Fund supported by bilateral donors—is to reduce the burden of foreign debt of the world's most heavily indebted poor countries to sustainable levels. Through this Initiative, Bolivia was initially granted a cancellation of external debt equivalent to US\$ 1.1 billion; under the HIPC II initiative, US\$ 1.5 billion of debt was cancelled, and through the “Beyond HIPC” process, cancellation of more than US\$ 2 billion up to 2015 was estimated.

In 2003, the Bolivian Poverty Reduction Strategy was updated for the 2004–2007 period; it proposed broad-based growth favoring the creation of thousands of jobs in micro-, small, and medium-sized enterprises in order to achieve accelerated social and economic impact (5). Part of this effort was also linked to the Millennium Development Goals (MDGs) formulated by the United Nations as a way to reduce global inequities. Bolivia drew up its second revision of the MDGs in 2002 (6); this has now become the driving force behind the Poverty Reduction Strategy.

The objective of reducing extreme poverty from 35% to 17.5% by 2015, as set forth in the Strategy, calls for economic growth at

a sustained annual rate of 5%–5.5% over the next 15 years (7). Gross domestic product increased 0.6% in 1999 and 2.5% in 2003, when the average per capita income was US\$ 900, but an income distribution analysis showed that the wealthiest 20% of the population had, on average, income 13 times higher than the poorest 20% segment. The presence of inequalities within poor groups was also noted; thus, in rural areas males had incomes 13 times higher than their female counterparts and, when comparing the data by gender and area of residence, an urban woman was shown to earn seven times more than her rural indigenous peer (Human Development Report, United Nations Development Program).

A change in leadership followed the June 2002 national elections. In February 2003, due to the high fiscal deficit and the Government's efforts to establish tax policies to control it, extensive conflicts arose, along with the demand for a constituent assembly and recovery of ownership of hydrocarbons; these resulted, in October 2003, in the Vice President of the Republic replacing the President through constitutional succession.

The political crisis resulted in several presidential changes between 2004 and December 2005, when a Presidential election was held. In January 2006, a new administration took office; its agenda includes nationalization of Bolivia's petroleum and natural gas reserves, and the development of social policies to reduce the country's cumulative social inequities. Its political plan includes achieving, by 2007, universal public health insurance, giving priority to decreasing undernutrition in children under 5 years old, strengthening the steering role of the Ministry of Health and Sports within the context of the self-governing and decentralization process the country is undergoing, and promoting community participation in health issues.

In 2001, 97% of Bolivian children between the ages of 6 and 13 were enrolled in school. Primary education is mandatory and free up to the eighth grade (8). For every 100 boys, there were 94 girls enrolled in primary education and 89 in secondary education. In the population as a whole, the illiteracy rate in men was 6.9%, and in women it was 19.4% (1).

Analyzing levels of education and income, it was found that the population's poorest quintile, consisting mainly of indigenous and native people (as opposed to those of European and mestizo origin), had an average of 3.6 years of education (3 years in rural

areas and 5.8 years in urban areas). The wealthiest quintile had 5 years of education in rural areas and 10.8 years in urban areas (9).

Various studies have shown that 53% of Bolivian communities are highly vulnerable to food insecurity; 16% of this population, or 7,718 communities, are the most vulnerable, and of these, 78% are extremely poor. By department, 80% of the communities of Chuquisaca and Potosí are highly vulnerable, as are 50% of the communities of Oruro, Cochabamba, and La Paz (10).

In 2004, 41% of the rural population had access to water through household plumbing, as compared to 88% in urban areas; just 5.3% of rural dwellings had sewer service, as compared to 57.6% in urban areas; 65% of rural households and 91% of urban households had electricity.

The percentage of protected areas in the national territory increased from 1% in 1990 to 16% in 2004. The country has progressively incorporated the principles of sustainable development in national policies and programs as part of its efforts to prevent further loss and degradation of environmental resources.

### Demographics, Mortality, and Morbidity

The population grew 8% between 2001 and 2005 (from 8,516,000 to 9,182,000 population). In 2005, 64.4% of the population lived in urban areas and 33.6% in rural areas. According to the 2001 census, 31% of the population identified themselves as being Quechua (i.e., of Incan descent), 25% as Aymara, and 6% as Guaraní or another ethnic minority of the Amazon region; 38% did not identify their ethnic origin.

In the same period, life expectancy at birth increased from 63 years (2001) to 64.9 years (2005). The low increase is due to high infant mortality, 54 per 1,000 live births, principally because of the component of neonatal death. The crude birth rate is 28.5 births per 1,000 population, due to the high fertility rate (3.7 children per woman), women's lack of autonomy in making decisions about and exercising their sexual and reproductive rights, and limited access to reproductive health services. The adjusted gross mortality rate decreased from 1,230.2 per 100,000 population in 2001 to 994.9 in 2005.

In a study conducted in 50 municipalities (of a total of 327 in the country) whose population is at the highest levels of extreme poverty and that included the native monolingual population, it was found that infant mortality is two times higher (48 per 1,000 live births) than in the 138 municipalities in which the poverty situation is less dire.

According to a 2003 study by the United Nations Development Program, the infant mortality rate stood at 78 per 1,000 live births in 2001 and decreased to 54 per 1,000 live births in 2005. But it must be emphasized that the probability of death in a child under 2 years old born to a woman who speaks only Spanish was 75 per 1,000 live births if she lived in the altiplano, 86 if she lived in the Andean valley area, and 92 if she lived in the plains area. In

comparison, the probability of death for a child of an Aymara woman who migrated to the plains was three times higher, or 206 per 1,000 children under 2 years old.

As regards birth rate, the 2003 National Demographic and Health Survey found that on average women had wanted to have 2.5 children and actually had 4.2. This difference was greater in rural areas, where women had wanted 3.2 children and had 6.4, than in urban areas, where women had wanted 2.2 children and actually had 3.3. A woman with an intermediate or higher level of education had, on average, 2.7 children during her childbearing years, whereas a woman with no formal education, generally indigenous or from a rural background, had 7.1 children during her reproductive years. If a woman had no formal education, the average age at which she would give birth to her first child would be 19 years; if she completed secondary education the average age would be 23 years (11).

Women have had little participation in politics and represent only 13% of the country's mayors; moreover, of all members of the bicameral National Congress in 2005, only 18% were female Deputies and 14% were female Senators. Unemployment was higher among women (5.9%) than men (3.9%) in 2003 (12).

The national system of vital statistics had not yet been consolidated in 2005, thereby placing limitations on the analysis of epidemiological data. However, the distribution of mortality in 2005 shows a predominance of cardiovascular diseases (40%), followed by communicable diseases (13%), external causes (12%), malignant neoplasms (8%), certain conditions originating in the perinatal period (5%), and other causes (21%). It should be emphasized, however, that this information may be biased, due to the aforementioned inadequacies in the national health system as of 2005.

Despite the fact that communicable diseases are still an important health problem in Bolivia, noncommunicable diseases are responsible for a much higher proportion of mortality, accounting for more than half of all deaths annually (13). Of these, diseases of the circulatory system are responsible for 40% of deaths, malignant neoplasms for 8%, and external causes (including accidents and other types of violent death) for approximately 12%.

The general mortality rate from all causes was higher in men (1,102 per 100,000 population) than in women (897 per 100,000 population). The mortality rate from diseases of the cardiovascular system was similar in both sexes; from neoplasms it was 1.5 times higher in women than in men; from external causes it was 2.5 times higher in men than in women; and from communicable diseases it was 1.2 times higher in men than in women.

More than half of maternal deaths (53.5%) occurred at home; 22% occurred during pregnancy, 36% during childbirth, and 42% during puerperium. The principal causes were hemorrhage (39% of cases), eclampsia (21%), abortion (10%), and other causes (30%). The coverage of institutional births in 2003 was

57%. The probability of maternal death was higher in rural areas, the altiplano, and the high Andean valleys.

## HEALTH OF POPULATION GROUPS

### Children under 5 Years Old

Vaccination coverage of children aged 12–23 months in 2003 was, on average, 50%. The vaccines whose coverage exceeded 90% were the BCG tuberculosis vaccine, the first dose of DPT (diphtheria, pertussis, and tetanus), and the polio vaccine (11); the lowest coverage occurred mainly with the third doses of DPT and polio vaccine, 49% and 39%, respectively. Just 5.9% of children in this age group had had all their vaccinations, and 4.8% had had none.

In the same year, the prevalence of acute respiratory infections (ARIs) in children under 6 months old was 16.8%, while in children aged 6–11 months old it was 29.8%; 40.6% of children under 6 months of age received care at a health center or post, compared to 36.4% of those aged 6–11 months. The prevalence of diarrhea among children under 5 years of age was 22%, while for those aged 6–23 months, it was 35%, and for the age group under 6 months old, it was 16%. The difference in prevalence between children under 5 living in rural areas and those living in urban areas was minimal (24.1% and 21.1%, respectively). In all three age groups, only 36% received care from a health provider or establishment; 29% received treatment with oral rehydration salts, and 16% were given homemade preparations. During the period 1999–2002, care coverage for cases of diarrhea at health establishments for the poorest population quintile in rural areas remained stable at around 45%, while care coverage for the population's wealthiest quintile stood at approximately 90% in 2002.

Breast-feeding is practiced during the first year of life. In 2003, 93% of children between 10 and 11 months of age were still being breast-fed; however, the rate of exclusive breast-feeding in the first two months of life was 70%, and this percentage decreased to 56% for children between the ages of 2 and 3 months. On average, 54% of children under 6 months old were being exclusively breast-fed; consequently, the introduction of complementary foods began early, occurring among 21% of children during the first two months of life and among 45% of those between the ages of 4 and 5 months of age.

A 2001 study by the Pan American Health Organization concluded that a slow decline in the numbers of neonatal deaths during the review period was related to high prevalences of infectious diseases (32%), of disorders related to prematurity and low birthweight (30%), and of specific respiratory disorders and disorders originating in the perinatal period (22%). Overall infant mortality declined from 67 to 54 per 1,000 live births between 1998 and 2003. For mothers without a formal education, however, the figure was 87 per 1,000 live births; it was 73 in the

poorest municipalities; 72 among the poorest population quintile and in the country's poorest department (Potosí); 67 in rural areas; and 61 in the altiplano area (11).

### Children 5–9 Years Old

Parasitic intestinal diseases among this age group are a serious public health problem. The prevalence of ascariasis ranged from 5% to 80%, with an average of 40% to 50% in the tropical zones. The prevalence of trichuriasis ranged from 10% to 66%, while the prevalence of uncinariasis is 15%, in contrast to the much lower prevalence found in the Andean regions where there is better access to clean drinking water and sanitation services. In La Paz, the prevalence of oxyuriasis was 29%; in the marginal zones of the city, it was even higher.

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

The adolescent population accounted for 22.1% of the country's total population in 2004, with 49.3% being female and 50.7% male and 65% residing in urban areas. Economic need forces many adolescents to seek work to help their families. Some 65% work in domestic activities, in which females predominate as household employees. Additional areas in which adolescents work include other types of services to households (26.9%), trade and services (24.1%), and industry (22.9%).

According to the 2003 National Demographic and Health Survey (11), 16% of females ages 15–19 years old had had one pregnancy, and one of every three had had children before the age of 20. The highest percentage of adolescent pregnancies occurred among women without a formal education (47%); by place of residence, the highest percentages of adolescent pregnancies were found among rural women (22%) and among those in the plains area (21%). Of all consultations at public health facilities, 30% were for problems related to complications of pregnancy (including abortion), childbirth, and puerperium.

In the area of family violence, it has been estimated that, in 2003, in the cities of La Paz, Cochabamba, Santa Cruz, and El Alto, 7 of every 10 adolescents suffered psychological violence in the home, manifested by reprimands, yelling, insults, indifference, and prohibition from leaving the house. As regards physical violence, in 2004, the highest number of cases recorded at the national level occurred in La Paz (46%), Potosí (16%), and Cochabamba (12%).

### Adults 20–59 Years Old

The total fertility rate dropped from 4 children per woman in 2001 to 3.7 in 2005. Maternal mortality decreased during the same period, from 390 to 230 per 100,000 live births. While 99% of women with a secondary or higher level of education were

knowledgeable about modern birth control methods, only 54% of women without a formal education knew about them, and only 7.6% actually used them (11).

### Older Adults 60 Years Old and Older

In 2005, this age segment represented 7% of Bolivia's population, with a growth rate of 4.4%. According to the Index of Basic Unmet Needs, 63% were living in poverty. Some 46% of this population continued to be economically active, and only 13% of women became inactive due to retirement. The household economic contribution rate for older adults was 33.8% in urban areas and 58.4% in rural areas, with this difference possibly being due to the low coverage by the pension system and the marked poverty in rural areas. Of the population over 60 years old, 47.8% were illiterate; of these, 70% were women. Eighteen percent of Bolivian households were headed by an older adult (14). No data are available regarding the situation of this age group among native populations and the rural poor.

### The Family

In 2004, slightly more than 90% of the Bolivian population lived in a family environment. Almost 12% of families were headed by a single parent; of these households, 83.7% were headed by women; this phenomenon was due in part to the migration of the male head of household in search of temporary work in other parts of the country. In the cases in which both parents migrate, grandparents or other relatives were often left in charge of the household.

### Workers

Sixteen percent of Bolivian workers were insured in 2004; 64% of the urban population performs work associated with the informal sector and, consequently, is excluded from the country's Compulsory Social Security mechanism. Workers in the informal sector reported an average out-of-pocket health expenditure of US\$ 20, compared to US\$ 25 by their counterparts in the formal sector; this difference is reversed, however, when catastrophic expenses (i.e., those that constitute more than 30% of the household's disposable annual income) are analyzed. Of all households whose out-of-pocket health expenditures exceeded 10%, 61% represented those whose family members performed work in the informal economy, while the remaining 39% held employment in the formal economy.

Many occupational illnesses are misdiagnosed, and the National Health Information System does not keep records of work-related accidents or illnesses, since information collection forms do not include these variables.

### Persons with Disabilities

According to information from the Ministry of Health and Sports, 10% of the Bolivian population had some degree of disability. Although there is no clear information regarding the classification of disabilities, in general terms physical disability accounted for 3%, mental disability for 3%, sensory disability for 3.5%, and other types of disability for 0.5%.

Although Bolivia has a law for persons with disabilities, various obstacles hamper an effective response to the problem, including the lack of pertinent health policies, regulations, training programs for health professionals, and new strategies for and approaches to prevention and rehabilitation; moreover, there is a need for coordinated collaboration between social and community actors to find approaches that are feasible within the context of the country's current reality.

### Ethnic Groups

According to the 2001 census, there were high rates of infant mortality in the native population. Some 37% of childbirths were attended by a doctor, 18% by another person, and 14.7% by a midwife; 21% were unattended childbirths. In 2005, a study was conducted of institutional birth levels by municipality among native monolingual women. Fewer than 7% of all births in the eight municipalities whose female populations were 80%–89% indigenous took place in a health care facility; among the 12 municipalities in which 70%–79% of the female population was native monolingual, this figure was 10%; in contrast, in the 138 municipalities where the percentage of native monolingual women was 9% or under, 45% of all births occurred in a health establishment (15).

Data from the Program for the Improvement of Surveys and the Measurement of Living Conditions show that, between 1999 and 2000, the levels of institutional care during childbirth (approximately 35%) did not increase among pregnant women in the poorest native population quintile in rural areas (15).

## HEALTH CONDITIONS AND PROBLEMS

### COMMUNICABLE DISEASES

#### Vector-borne Diseases

The information on **malaria** recorded through the National Health Information System for the 2001–2005 period is shown in Table 1. It is worth noting that in 2004, nearly 50% of all malaria cases occurred in the department of Beni, principally in the municipalities of Riberalta (annual parasite incidence [API] 43 per 1,000 population) and Guayaramerín (API 60 per 1,000 population). In 2005, 55% of the cases were recorded in Beni; Beni and Pando have the highest risks of malaria in the country (API 37 and 43 per 1,000 population, respectively).

**TABLE 1. Suspected and confirmed malaria cases, Bolivia, 2001–2005.**

Year	Suspected cases	Total	Confirmed cases		API <sup>a</sup> per 100,000 population
			<i>Plasmodium vivax</i>	<i>Plasmodium falciparum</i>	
2001	122,926	15,765	14,957	808	5.0
2002	137,509	14,276	13,549	727	4.3
2003	158,299	20,343	19,550	793	6.1
2004	163,307	14,910	14,210	671	4.4
2005	104,300	20,142	19,062 <sup>b</sup>	1,031 <sup>b</sup>	5.5

<sup>a</sup>API calculated on the basis of the estimated at-risk population in endemic areas.

<sup>b</sup>49 mixed.

**Source:** National Health Information System.

There were 5 cases of **yellow fever** in 2001, 14 in 2002, 4 in 2003, and 11 in 2004; all of these cases were laboratory-confirmed. In 2005, 73 suspected cases were reported, of which 16 were confirmed (13 in Cochabamba, 2 in Santa Cruz, and 1 in La Paz).

The incidence of **leishmaniasis** was 24 per 100,000 population in 2003 and 37 in 2004. This increase was due to the migration of populations to endemic areas and subsequent modifications to the physical environment. The departments at highest risk were Pando (409 per 100,000 population), Beni (158 per 100,000 population), and La Paz (52 per 100,000 population). Some 2,800 cases were reported in 2004, 48% in La Paz, 20% in Beni, and 9% in Pando.

In 2001, 176 confirmed cases of **dengue** were reported; in 2002, there were 892 suspected cases, of which 278 were confirmed; in 2003, 4,624 suspected cases were reported; in 2004, 7,395 suspected cases were recorded, of which 682 were later laboratory-confirmed; and in 2005, 4,179 suspected cases were reported, with 617 being laboratory-confirmed. Two-thirds (66%) of the national total occurred in the departments of Beni (1,959 cases) and Pando (799 cases); Pando had the highest cumulative risk (1,198 per 100,000 population), followed by Beni (481 per 100,000 population); the figures of both departments were far above the national rate (44 per 100,000 population). In 2004, 48 cases of hemorrhagic dengue fever were recorded, with 6 deaths registered; in 2005, there were 10 confirmed cases of hemorrhagic dengue (7 in Santa Cruz de la Sierra and 3 in Cobija); there were no registered deaths from dengue that year.

The vector for **Chagas' disease**, *Triatoma infestans*, is present in seven of Bolivia's nine departments, which together cover 84% of the country. In 2001, with Inter-American Development Bank funds, household chemical treatment coverage was gradually extended in the endemic area, and in some parts the two cycles were completed and post-spraying entomological evaluations were stepped up. In 2002, due to technical and administrative problems, the original programming targets were not met. In 2003, there was a complete sweep of 670,000 dwellings. In 2004, house-

hold spraying was selective, although all positive households were treated. In 2005, guidelines established for stratification were followed, based on the response to earlier control measures.

Up to 2005, the risk of vector transmission following spraying actions was eliminated in 70% of the endemic territory; moreover, there has been a reduction in the risk of disease transmission through increased systematic screening for Chagas of all blood donations to certified blood banks. In 2005, the seroprevalence rates in children under 15 years old (almost 40% of the population) ranged from 10% in urban areas to 40% in rural areas of six endemic departments, which together constitute nearly 50% of the national territory. It has been estimated that some 700,000 children under age 10 live in the endemic area and that of these, some 100,000–140,000 might possibly be infected with *Trypanosoma cruzi*.

### Vaccine-preventable Diseases

Since 2000, the number of diseases for which vaccines are available to protect the population under 2 years old has grown from 6 to 11: poliomyelitis; tuberculosis; diphtheria, pertussis, tetanus, hepatitis B, and diseases caused by *Haemophilus influenzae* type b (these five make up the pentavalent vaccine, introduced in 2000); measles, rubella, and mumps (through the triple viral vaccine, also introduced in 2000); and yellow fever. Yellow fever vaccine is also administered to the at-risk adult population, and the vaccine for diphtheria and tetanus is administered to women 15–39 years old. In 2004, coverages of 86% were achieved for BCG tuberculosis vaccine, 84% for the third dose of poliomyelitis vaccine, 84% for the third dose of DPT vaccine, 90% for the triple viral vaccine, and 84% for the third dose of the hepatitis B vaccine in children under 1 year of age.

During the 2001–2005 period, the rate of **acute flaccid paralysis** in children under 15 years old ranged from 1.38 to 1.93 per 100,000 population. For **measles**, the proportion of suspicious cases investigated within 48 hours exceeded 98% during this same period; since 2001 there have been no confirmed cases, and

the last follow-up campaign against measles was conducted in 2003. Measles and **rubella** surveillance has been combined since 2004. In 2000–2001, a rubella outbreak occurred affecting 985 individuals; subsequent to the outbreak, the incidence of confirmed rubella has been falling, with 41 cases being detected in 2003, 12 in 2004, and 8 in 2005. Since 2001, an average of 3 cases of **neonatal tetanus** have been reported each year. Case numbers of **yellow fever** have declined due to the implementation of a mass vaccination strategy in the at-risk departments and increased vaccinations in municipalities with high numbers of temporary migrants; thus, during the 2001–2005 period, only 16 confirmed cases of yellow fever were reported. **Pertussis** and **diphtheria** are likewise on the decline, with only 68 cases and 8 cases, respectively, being reported during the entire 2001–2005 period.

Since 2003, Bolivia has joined in the activities carried out every year for Vaccination Week in the Americas. In October 2005, sentinel surveillance of **rotavirus infections** in hospitalized children under 5 years old began, in order to prepare the country for the introduction of this vaccine into the regular vaccination schedule. In December 2005, the Vaccination Law was approved in order to ensure the financial sustainability of the national vaccination program and its ability to procure vaccines. In May 2006, the country joined the Americas-wide effort to eliminate rubella and **congenital rubella syndrome** by carrying out its own national campaign.

### Intestinal Infectious Diseases

In children under 5 years old, 541,697 cases of **acute diarrheal diseases** were reported (282.1 per 1,000 population ages 0–4) in 2001; 611,982 cases were reported in 2002 (291.1 per 1,000); and 701,182 cases were recorded in 2003 (269.3 per 1,000). In 2003, 22% of children under age 5 had had an episode of diarrhea in the two weeks prior to the National Demographic and Health Survey conducted that year (11). From 2001 to 2003, 80% of all cases of acute diarrhea reported in the country occurred among children under 5 years old (16).

No cases of **cholera** were reported during the 2001–2005 period.

### Chronic Communicable Diseases

In 2001, the National Tuberculosis Program reported 8,761 new cases of all forms of **tuberculosis**. The incidence rate for all forms was 113 per 100,000 population in 2002, and 80 per 100,000 population for the pulmonary forms with positive bacilloscopy (BK+). In 2003, 7,718 BK+ pulmonary cases were diagnosed (85.5 per 100,000 population), while in 2004 the number of cases decreased to 7,544 (81.8 per 100,000 population). In 2005, of all recorded cases of tuberculosis in all its forms (9,196), 7,527 were BK+ pulmonary (79.8 per 100,000 population). The highest rates for this case finding were in the departments of Pando (113 per 100,000 population) and Santa Cruz (108 per

100,000 population). In 2005, it was found that there is insufficient passive case-finding; there is active case-finding without impact evaluation and without adequate planning vis-à-vis specific human groups or risk areas, and there is no TB/HIV coinfection investigation.

Eighty-five cases of **leprosy** were reported in 2003 (with an incidence rate of 0.07 per 100,000 population) and 76 in 2004, 39 of which were from Santa Cruz. In 2004, the at-risk population was estimated to be 677,280 persons throughout the country. The highest prevalence was recorded in the departments of Santa Cruz (1.34 per 100,000 population) and Pando (0.87 per 100,000 population).

### Acute Respiratory Infections

In 2003, approximately 260,000 medical care visits related to ARIs were reported, while the following year the number of visits totaled more than 2 million; of these, half involved children under 5 years of age. By late 2004, 60% of ARI cases involved children under 5 years old. In 2004, 224 medical visits were recorded for every 1,000 persons nationwide. The illness showed a characteristic seasonal pattern, with an increase in the number of cases treated in the autumn and winter, and an average reporting of more than 155 medical visits per 1,000 population in July of each year (16).

### HIV/AIDS and Other Sexually Transmitted Infections

In 2003, the most affected age groups were the 25–34-year-old group (45%) and the 15–24-year-old group (26%). The most common transmission mode continues to be sexual: 67% heterosexual, 23% homosexual, and 10% bisexual. The male-female ratio is 2.8:1. Half of the 225 persons diagnosed with HIV infection during 2003 already had progressed to the AIDS stage, indicating that early detection remains a serious challenge. Sentinel surveillance detected an HIV prevalence of less than 1% among pregnant women and higher than 5% among populations that engage in high-risk behavior. The country is thus classified as having a concentrated epidemic.

In 2001, the syndromic approach was incorporated in the recording of suspected cases of sexually transmitted infections (STIs), but case recording is very deficient, particularly as regards genital ulcers, a condition characterized by irregular reporting. At the current time, there are no activities aimed at the elimination of congenital syphilis, and syphilis detection during pregnancy and in newborns is not carried out on a regular basis.

According to information from the country's STI/AIDS Surveillance and Referral Centers, which perform monitoring and follow-up activities related to commercial sex work, a decrease in the proportion of individuals with **syphilis** (4.2% to 1.1%) and **gonorrhea** (6.8% to 2.7%) was noted between 2001 and 2004; however, the percentage of cases of **chlamydial infection** has increased: it was almost 13% in 2004, as compared to 7.8% in 2001.

## Zoonoses

There were two deaths due to human **rabies** in 2003, six in 2004, and 11 in 2005. With regard to canine attacks of humans, there were 15,182 cases reported in 2004, with children being the most affected group; the majority of the attacks were by stray dogs. Approximately half of the bites (45%) occurred in the department of La Paz, but the risk of attacks was highest in Chuquisaca (286.1 per 100,000 population), followed by La Paz and Cochabamba, with the latter recording 22% of all those injured. In 2005, 14,544 people were bitten (154 injured per 100,000 population), a figure similar to the one for 2004. The high incidence of canine rabies in Bolivia is due to the lack of an operating program overseen by the Ministry of Health and Sports, Departmental Health Services (known as SEDES, for its Spanish acronym), and the municipalities, especially in the nine departmental capitals, that would enable coordination of the various aspects required for effective canine rabies control. In 2004, 408 canines tested positive for rabies, and in 2005, this number increased to 897; of these cases, 54.6% (490) were recorded in the municipality of Santa Cruz and 18.5% (166) in Cochabamba. In the absence of a sustainable national control program, actions to stem the epidemic have been of short duration and limited to mass campaigns which did not achieve the desired results; for example, four mass vaccination campaigns carried out by health authorities and council members in Santa Cruz reached only a 50% coverage rate. Consequently, it is essential for the Ministry of Health and Sports, the SEDES, and the municipalities to have an operating program and the resources necessary to achieve rabies control and eradication in the coming years.

In 2005, the National Service for Livestock Health and Food Safety (or SENASAG, for its Spanish acronym) declared Bolivia free of **foot-and-mouth disease** with vaccination. Based on the fact that no cases of foot-and-mouth disease had been reported for two years and that the World Organization for Animal Health (or IOE, for its acronym in French) had declared the department of Oruro as being free of the disease, SENASAG requested that the Pan American Health Organization provide the support of two experts from the Pan American Foot-and-Mouth Disease Center (PANAFTOSA) for the purpose of training SENASAG veterinarians to conduct national serologic sampling during 2006. Once the laboratory results are evaluated—and if an absence of viral activity is demonstrated—Bolivia will submit its application to the IOE and request that it be granted status in the category of a country free of foot-and-mouth disease with vaccination.

Between 2001 and 2005, 122 cases of **hantaviral disease** were reported, with 50 of these cases being laboratory-confirmed. Up until 2003, all reported cases had originated in the department of Tarija. In 2004, 10 cases were recorded (0.1 per 1,000 population), 6 originating in the city of Bermejo, department of Tarija, and one originating in Montero, department of Santa Cruz, with a fa-

tality rate of 20%. In 2005, 64 suspected cases were reported and 18 were confirmed by laboratory testing.

## NONCOMMUNICABLE DISEASES

### Metabolic and Nutritional Diseases

Twenty-seven percent of all Bolivian children under 5 years of age suffered from chronic **malnutrition**, the rate being higher for children in rural areas (37%). When analyzing this situation within the context of poverty levels, it was shown that 42% of children under age 5 in the lowest quintile suffered chronic malnutrition, in comparison with only 5% in the highest quintile. Nearly 8% of children in this age group had low weight-for-age. One of every three women of childbearing age exhibited some degree of **anemia**, and one of every two children experienced some degree of anemia, with 25% of all children having mild anemia and 25% having moderate anemia (11).

Physical activity levels among Bolivians are generally low, with women being less likely to be physically active than men. Participation in sports decreases with age, and the disparities in activity levels between men and women also tend to increase with age. According to the 2003 National Demographic and Health Survey, 74% of men and 41% of women reported having participated in some type of recreational physical activity during the week prior to the survey (11). After the age of 60, more than 83% of women and 60% of men were inactive. Physical activity levels also tend to be lower among the poorest and less educated sectors of the population (17).

### Malignant Neoplasms

Despite underregistration, available data indicate that cervical cancer is the most frequently reported type of cancer (21%), followed by neoplasms of the digestive system (14%) and those of other female genital organs (11%).

Cervical cancer is one of the leading causes of death among women, particularly those in the 35–64 age group. In 2004, the estimated incidence stood at 151.4 per 100,000 women, while new estimates in 2005 indicated the overall incidence to be 58 per 100,000 women. Higher incidences were recorded in the departments of Oruro and Potosí (60.9 and 93.5 per 100,000 women, respectively).

In some regions, the level of cervical cancer screening is less than 7% among women ages 25–49 years old (18). There is a difference between the number of cervical cytology samples taken and the number of samples with results reported. Given the importance of cervical cancer as a public health problem in Bolivia, over the short term the Ministry of Health and Sports plans to address the following areas: the need to develop strategies aimed at empowering women to exercise autonomy in their health care, to improve the recording system, to strengthen the skills of health

and laboratory personnel, and to improve the quality of early intervention services and treatment.

## OTHER HEALTH PROBLEMS OR ISSUES

### Disasters

During 2001–2005, Bolivia was affected by a variety of natural disasters and those caused by humans, including floods, landslides, drought, blizzards, hurricane winds, earthquakes, hailstorms, forest fires, and social conflicts. Of these, floods and social conflicts led to the highest number of deaths (198). Some 150,530 families were affected by disasters, with the presence of poverty further aggravating their fate and the consequences creating a significant setback in terms of the population's overall health and development status.

A flood affecting large segments of the La Paz population occurred in 2003, the aftermath of an intense hailstorm. This event revealed the municipal health system's weak disaster response capacity; in particular, the staff of the emergency and morgue sections of the Hospital de Clínicas soon found themselves overwhelmed with the arrival en masse of the injured and dead.

In 2002, a large-scale forest fire broke out outside the city of Tarija in the Cordillera de Sama. Approximately 2,000 firefighters and other volunteers working to put out the fire suffered burn injuries and conjunctival and respiratory problems. Smoke from other forest fires and the traditional slash-and-burn techniques carried out to prepare land for cultivation also affected local populations and agricultural workers, causing respiratory and eye problems.

### Violence and Other External Causes

A 2003 study of six Bolivian municipalities revealed that 55% of married women or women in long-term relationships and of reproductive age had experienced violent acts (physical, sexual, and psychological) committed against them by their intimate partners (19). At the same time, child abuse is a problem of growing concern, affecting as many as one out of every three boys and girls (20).

A series of social conflicts occurring in February and October 2003 and May–June 2005 provoked confrontations among the civilian population, the police, and the army, resulting in more than 80 deaths and 450 injuries; for example, in 2004 there were 3,907 civil disturbances, including marches, strikes, and roadblocks, throughout the country (21). During these incidents, all roads leading into the capital were blocked, which resulted in a shortage of basic foodstuffs and fuel (diesel, gasoline, and gas), and the inability to travel within the city and to access the airport. These events pointed to the vulnerability of the city's infrastructure and, in particular, the weak emergency response capacity of the hospital system.

Estimates by the Ministry of Health and Sports in 2004 indicated that there were 55 traffic accidents every day (2.5 per hour), implying significant social cost and effects on the population's health. In 2004, the mortality rate from accidents was nearly 7 per 100,000 population. In more than 90% of all traffic accidents, there was some human liability and contributory behavior, with failure on the part of the driver to respect traffic regulations, intoxication, and speeding being the most common causes; mechanical failures accounted for only 2.5% of all accidents (16).

### Mental Health

A study conducted in La Paz in 2005 found that, at the secondary level of care, there had been consultations due to depressive disorders, disorders related to the use of psychoactive substances, and suicide attempts. In childhood, attention disorders and enuresis were common. The public health care services are experiencing challenges related to adequate training of personnel, availability of guidelines and drugs, case recording and surveillance, and referral services (just 11% of the tertiary-level hospitals nationwide have mental health services or offer specialized care) (21).

### Addictions

The 12–18-year-old age group was at highest risk for narcotics use, according to the results of a study conducted by the Directorate for Total Prevention of Drug Dependency and for Mental Health in 2000. In 2004, the prevalence of alcohol use over a month was 43%; it was 61% over a year and 68% over a person's lifetime; it was estimated that 10% of all drinkers were alcoholics; for every ten men with alcohol problems, there were two women with the same problem. This pattern appears to be increasing, as well as initiating at very early ages (22).

Alcohol played a role in the majority of traffic accidents; of the 20,075 accidents occurring in 2004, 10,428 of the drivers were found to be intoxicated (21). Alcohol use and abuse are firmly entrenched in Bolivia and culturally based. The Ministry of Health and Sports and various nongovernmental organizations (NGOs) have made isolated attempts to address this social issue.

In 2004, the prevalence of tobacco use was found to be 25% in a month, 38% in a year, and 48% over a person's lifetime. It was estimated that at least 25% of adults smoked one or more cigarettes a month. About 5% of the population over age 15 were habitual smokers (10 or more cigarettes a day). A 2004 survey of smoking among adolescents ages 13–15 conducted in three Bolivian cities showed that half or more had smoked at some time and that approximately 30% were smokers at the time of the study (23). In general, smoking was more common in males than in females.

Tobacco research has been conducted in Bolivia, and awareness-raising strategies have been prepared for use with members of the National Congress, which facilitated ratification

of the Framework Convention on Tobacco Control in 2005. But the implementation of tobacco-related laws, development of tools to promote a reduction in the demand for and availability of tobacco, and the institutionalization of initiatives to promote smoke-free environments are still pending.

### Environmental Pollution

A 2004 risk analysis showed that the incidence rates of pesticide poisoning were highest in the departments of Pando, with more than 200 episodes per 100,000 population; Tarija, with 46 episodes per 100,000 population; and La Paz, with 34 per 100,000 population. Contrary to expectations, 63% of the episodes reported occurred in urban areas (16).

### Oral Health

Data from the College of Dental Surgeons in 2003 showed the index of decayed, missing, and filled teeth (DMFT) in children under age 12 to be 6.7, mainly due to the caries component. The DMFT index for children aged 9 was 6.6, and the prevalence of untreated caries was 84.6% (84% nationally). The DEFT (decayed, extracted, and filled teeth) index in children aged 5–9 was 4.75. There is no oral health care for pregnant women to prevent infection.

## RESPONSE OF THE HEALTH SECTOR

### Health Policies and Plans

In recent years, Bolivia has promoted important public policies regarding social insurance with the rationale of delivering benefits packages for health recovery and protection, with particular focus on maternal and child health; these insurance schemes were initiated in the mid-1990s with the introduction of the Basic Health Insurance mechanism, and, more recently, with the passage of legislation for a universal maternal and child health insurance system. In the latter case, the goal is to remove economic barriers preventing access to health care, especially in urban and rural centers where health services are available. However, since the country's native, rural, and isolated population segments remain largely excluded from social protection systems, access to this health insurance plan has been much more difficult. A 2005 study by the Economic and Social Policy Analysis Unit showed that 70% of the Bolivian population experiences some form of exclusion from social protection systems for health (2).

Following its election in 2005, the current government administration issued a document regarding national health policy focusing on strategies: (1) addressing health issues from the perspective of health determinants, with the goal of eliminating malnutrition in children under 5 years of age, (2) strengthening the national health authority's steering role during the decentralization process, and (3) promoting community participation in health.

Law 1551 on Popular Participation, promulgated in 1994, established the process for the decentralization of funds and responsibility for the administration of educational and health establishments from the State to the municipality level. In 1995, Law 1654 provided for administrative decentralization of some technical and administrative functions from the executive branch to the departmental level.

To further promote policy and administrative decentralization in the country, in July 2006 a nationwide referendum was held addressing further expansion of decentralization activities to the departments. Despite these measures, the poorest municipalities have experienced great difficulties in the local development and implementation of health processes due to their limited operating capacity and ability to mobilize resources.

In 2001, the Ministry of Health and Sports conducted an evaluation of the essential public health functions (24), and the best performance was identified in the functions of social participation and empowerment of citizens in health and in the development of policy and planning capacity to support efforts in public health. Average to inferior performance was identified in the functions of research, development, and implementation of innovative public health solutions; promotion of equitable access to necessary health services; ensuring the quality of personal and population-based health services; and human resources development and training. This diagnosis is consistent with the difficulties the Bolivian public health system has experienced in terms of services integration and coverage extension.

The country does not have general public health legislation, although it does have an extensive body of health regulations that require systematization and updating into the corresponding health codes or laws. The Social Security Code (1948), which still governs the tripartite (government, employer, and employee) system of health insurance, and the Health Code (1967), which governs the public and private sectors, have become outdated through the passage of newer legal provisions such as the Law on Community Participation (1994), the Law on Universal Maternal and Child Health Insurance (2003), and other legislation on specific health issues, such as the Law on Safe Blood.

### Health Strategies and Programs

Law 2426, effective 1 January 2003, provided for implementation of the Universal Maternal and Child Health Insurance legislation establishing comprehensive health benefits free of cost to all pregnant women from the start of gestation to six months following childbirth and to children from birth to age 5. The maternal and child health care programs, as well as those for nutrition and sexual and reproductive health, were included in the public insurance scheme as packages of established benefits. The benefits are provided at the various levels of the National Health System and the social security system. With the objective of achiev-

ing a satisfactory implementation of health sector policies, Ministerial Resolution #0018 dated 15 January 2003 provided that the Extensa Program—whose goal is to increase health coverage in remote rural communities through the use of mobile health teams financed by the World Bank—would coordinate all its activities, whether technical, logistical, or administrative, with pre-existing national health programs and projects under the Ministry of Health and Sports' aegis.

Over the past decade Bolivia has implemented important social policies geared toward the protection of older adults. These include the National Plan for Older Adults, the Bono Solidario, and Old Age Medical Insurance (1998).

### Organization of the Health System

The health systems structure is characterized by segmentation, lack of coordination, and inequity. Given this situation, various players have intervened in the provision of health care to the population: the public and private sectors, NGOs, the Church, and traditional medicine practitioners.

The organization of health services is not population-based, nor have the health needs of the population been sufficiently evaluated. Despite recent progress in the decentralization of authority and decision-making to the municipal and departmental levels, vertical programs continue to be established at the central level without sufficiently taking into account important cultural considerations of the target population. This deficiency presents challenges for the identification of viable and effective solutions to the health problems of local populations and thus the provision of appropriate and high-quality care.

The lack of mechanisms to stimulate intersectoral coordination and the fact that the various other players active in the health care arena do not fall under the purview of public health regulations and policies have led to a situation in which the range of activities undertaken by these groups correspond more to institutional priorities and exigencies and do not necessarily contribute to broad, long-term national public health objectives. The fragmentation and lack of coordination in the health care system is one of Bolivia's most insurmountable obstacles to the achievement of universal health services coverage in the near future.

The health insurance system currently covers 26% of Bolivia's population (21% through the National Health Care Fund and 5% through other, smaller funds) (25). It is estimated that 5%–10% of the population utilizes the services of the private sector, and that some 70% of the population is covered by public health sector services. However, due to obstacles limiting access to the public health system, it is estimated that only about one-half of this segment—or some 35%–40% of the population—is able to utilize the services (26). At the same time, it is estimated that half of the population uses traditional medicine techniques, while in rural areas its practice is particularly widespread (1).

### Public Health Services

The Ministry of Health and Sports' 2005–2009 National Plan for the Prevention and Control of Noncommunicable Diseases has identified a series of health issues requiring priority attention. These include diabetes mellitus, cardiovascular and rheumatic diseases, and cancer, as well as a group of related risk factors, such as smoking, alcohol abuse, sedentary lifestyles, unhealthy nutritional habits, and overweight. In 2003 and 2004, actions were taken to improve diagnostic strategies; the first national plan for responding to noncommunicable diseases at the primary level of care was developed; and Bolivia joined the CARMEN network, an initiative of the Pan American Health Organization composed of governmental and nongovernmental institutions, academics, and the private sector working together to develop joint activities for noncommunicable disease prevention in the Region of the Americas.

At the same time, improvements in the epidemiological surveillance and control of communicable diseases have been promoted. Prevention and treatment programs still remain largely vertical, and monitoring and evaluation processes either have not been carried out in the majority of the departments or they have been carried out only intermittently. The “epidemiological shield” surveillance strategy has been operationalized and will target malaria, Chagas' disease, tuberculosis, yellow fever, and leishmaniasis. Vector control activities promoted by family and community medicine teams support this effort.

The National Blood Program was officially established in 2002. While the annual rate of donors is very low (less than 20 per 1,000 population), the number of blood donations has increased in recent years. In 2003, 5,498 voluntary donations were received at the departmental-level blood banks, representing 29.4% of the total of 18,317 units obtained, and in 2004, 7,818 voluntary donations were received, representing 34.6% of the 22,581 units obtained. Up until 2004, the country continued to rely to some extent on paid blood donations. Donations are screened for HIV; in 2002, 33,204 serological tests were conducted in 24 blood therapy services in Bolivia, with 30 of these (0.09%) testing positive for HIV.

In 2003, the National System of Health Laboratories was established under the responsibility, control, and technical oversight of the National Health Laboratories Institute.

The quality of water from river sources is poor, largely untreated, and thus not safe for human consumption. Contamination is caused principally by industrial, mining, and agricultural activities utilizing pesticides and fertilizers, and improper domestic use of river water. Populations in the Amazon Basin area are also exposed to heavy metal poisoning, especially mercury, a byproduct of gold-panning activities in streams and riverbeds.

The large number and variety of disasters that occurred in Bolivia over the past five years spurred government officials at the national, departmental, and municipal levels to accord higher priority to disaster prevention and management policies, plans,

and activities, resulting in the organization of emergency operation centers in some municipalities and prefectures. In 2003, beginning at the central level, the country began to upgrade its disaster preparedness and response capacity, extending these improvements to the regional level through the development of regulations and training activities. The Ministry of Health and Sports introduced an area specialized in disaster prevention and response, and in recent years, this entity has responded with technical support to several disaster events, working in coordination with the departmental-level SEDES health services. SEDES teams also received training in immediate response techniques, damage assessment and health needs analysis, risk management, the SUMA (Humanitarian Supplies Management) System, the Logistical Support System, and other related tools.

In 2004, the Vice Ministry of Civil Defense, with technical input and support from the health sector, began preparing a manual for the National Emergency Operations Center. The manual, to be used as a tool for the effective management of emergency situations, delineates the functions of disaster preparedness and response personnel and the coordination of efforts with various special committees supporting the Center's work. In 2005, work began on the design of a national health sector plan for emergencies and disasters; it is currently being reviewed by health authorities and key stakeholders.

### Individual Care Services

The country's health services are organized into networks that include four levels of operation (national, departmental, municipal, and local or "health establishment") and three levels of care. Health services are concentrated in the urban areas (health posts, centers, and hospitals) and characterized by gaps in access to and quality of care, particularly for vulnerable groups, such as older adults, children who work or live on the street, and those living in extreme poverty. In the marginal urban areas, there are no hospitals or health centers and only a limited number of health posts and trained personnel. In large expanses of rural areas, the scarcity of physicians has led to the assumption by nursing auxiliaries of this responsibility in the provision of health interventions.

In 2004, there were 1.29 physicians and 14 beds per 1,000 population. In that same year, there were 3,021 health care establish-

ments; of these, 77.6% belonged to the public sector, 10.7% to the social security system, 5.5% to NGOs, 3.2% to the Church, and 3% to the private sector. Of this total number of health care establishments, 90% were at the primary care level, 6.6% were at the secondary level, and 3.2% were at the tertiary level (Table 2). The primary-level outpatient establishments in the public system normally include a general physician (or, in the social security system, a family doctor), a nurse, and nursing auxiliaries; this composition, however, may not be strictly adhered to in all establishments due to local circumstances. When health problems require specialized care, the users are required to go to the general hospitals, where outpatient care and hospitalization are provided in four basic specialties: internal medicine, surgery, gynecology and obstetrics, and pediatrics. The users are required to pay for any type of care not included as a benefit in the universal maternal and child health insurance system as an out-of-pocket expense.

### Health Promotion

During the 2001–2005 period, there was significant progress in the development of the "healthy municipality" approach. In municipalities such as Chacaltaya and Curahuara de Carangas in the high Andes area, mayors have promoted and incorporated the concept in a variety of local initiatives. In the Chaco lowlands area of eastern Bolivia, the healthy schools and spaces approach has taken root, while in the municipal capital cities, the healthy environments strategy has been adopted.

The Vice Ministry of Sports, under the Ministry of Health and Sports, has launched various interventions to promote physical activity, including the introduction of various programs in the primary school curriculum targeting different age groups, the inclusion of questions regarding the population's physical activity levels in the 2003 National Demographic and Health Survey, and the training of participants in International Challenge Day, a competitive event celebrated in communities around the world to raise awareness regarding the importance of active lifestyles and regular physical exercise.

Promotion of healthy schools, marketplaces, and environments has relied heavily on the active involvement of communities and the support of local government leaders. While these experiences have produced encouraging results, there is a need for

**TABLE 2. Health establishments, by institutional type and care level, Bolivia, 2004.**

	Primary level	Secondary level	Tertiary level	Total
Public sector	2,210	116	19	2,345
Social security	218	36	70	324
NGO	156	5	4	165
Church	81	16	1	98
Private sector	56	25	8	89
Total	2,721	198	102	3,021

a formal evaluation of their different components in order to build the evidence base and share lessons learned with others in the future. This process will also provide valuable input for the development of healthy public policies and higher visibility on the public health and political agendas, the strengthening of partnerships, expansion of best practices, and improved training and development of human resources.

### Human Resources

In 2002, there were 45,189 individuals working in the health field; of these, 35.2% were employed in the public sector, 34.9% in the private sector, 27.5% as part of the social security system, and 2.4% with NGOs devoted to health-related issues. In this group, 24.1% were doctors, 10.5% were nurses, and 22.2% were nursing auxiliaries.

In the public health sector, there were 14,538 workers, of whom 34.8% were professionals, 5.7% were health technicians, 30.6% were auxiliaries, 12% performed administrative tasks, and 16% provided various services. La Paz and Santa Cruz had the highest percentages of public health personnel, 24.6% and 21.2%, respectively, while Oruro and Pando had the lowest proportions, 5.2% and 2.9%, respectively.

In the social security sector, there were 13,138 employees, of whom 41.2% were either physicians or nurses, 3.6% were health technicians, 17.7% were auxiliaries, 22.2% performed administrative tasks, and 15.3% provided various services. Most of these personnel were located in La Paz (38.8%), Santa Cruz (19%), and Cochabamba (12.6%).

In general, most of the medical (43.7%) and nursing (49.9%) personnel were involved in the tertiary level of care, while 56.1% of the nursing auxiliaries performed at the primary level. The social security system had a ratio of 14 doctors, 1.7 dentists, 6 registered nurses, and 11 nursing auxiliaries per 10,000 population; in the public sector, the ratios per 10,000 population were 3.2 doctors, 0.4 dentists, 1.6 registered nurses, and 4.7 nursing auxiliaries (27).

One of the most serious challenges affecting the country's health sector policy is the effective integration of the various types and levels of health care personnel, given the current lack of rationalization and equitable distribution and use of human resources.

### Health Supplies

A 2005 study of drug prices revealed that, on average, brand name products are 21 times more expensive than their generic equivalents, and in the case of relatively new drugs, were 65 times more expensive. In comparing the cost of treatment with brand name and generic drugs, a great difference was also noted. For example, treating a respiratory infection cost five times more with brand name drugs (US\$ 7, equivalent to 3.8 days of national

minimum salary) than with generic drugs (US\$ 1.25, equivalent to 0.72 days of national minimum salary).

In the majority of cases, generic drug prices were lower in the public sector than in the private for-profit sector, yet the limited availability of these drugs in the public sector often required that patients purchase them on the private market, albeit at a higher price.

### Research and Technological Development in Health

National science and technology policy is governed by the Ministry of Government (*Ministerio de la Presidencia de la República*). In 2005, the Ministry of Health and Sports promoted the organization of a "Research Board" that called together all the country's public health experts working in the research arena. The board's principal objective was to provide input to the Ministry that would enable it to develop public health research policies and strengthen national regulatory capacity.

In January 2005, the Ministry of Health and Sports issued a resolution for the creation of a virtual public health library on topics of national relevance, and invited various academic institutions, NGOs, and other associations to participate in its development in accordance with the model established by the Latin American and Caribbean Center on Health Sciences Information (BIREME). The methodologies that were adopted facilitated the integration and supplementation of technology and content; a decentralized, yet controlled process for updating of the information modules; secure registration and contents validation processes; and comprehensive sources identification.

An analysis of the scientific and technical works registered in the Latin American and Caribbean Health Sciences Literature (known as LILACS, for its Spanish acronym) and the Pan American Network of Information and Documentation in Sanitary Engineering and Environmental Sciences (or REPIDISCA, for its Spanish acronym) databases showed that, in 2001 and 2002, Bolivia produced an average of 300 publications a year.

### Health Sector Expenditures and Financing

Funds allocated for the public sector come from the following sources: the National General Treasury, internal cash generation, foreign credit, and donations; private sector source funds include businesses and institutions, as well as support provided by international cooperation agencies and bilateral support from other countries.

Notwithstanding the above-mentioned sources, much of the sector's funding came from out-of-pocket expenditures. While average estimated out-of-pocket spending was US\$ 13 per month in 2002, some households declared annual expenditures on health care that exceeded US\$ 5,000. The average out-of-pocket expenditures for individuals living in extreme poverty were US\$ 9, US\$ 12 for those living in moderate poverty, and US\$ 19

## **Bringing Universal, Comprehensive Maternal and Child Health Care to Underserved Populations**

Maternal mortality decreased from 390 per 100,000 live births in 2001 to 230 per 100,000 live births in 2005; infant mortality stood at 78 per 1,000 live births in 2001 and at 54 per 1,000 in 2005, while mortality among children under age 5 also declined during this same period from 77.6 to 65.3 per 1,000 live births. With the goal of sustainably reducing maternal and infant morbidity and mortality, legislation implementing the Universal Maternal and Child Health Insurance initiative was approved in January 2003, providing comprehensive health benefits free of charge for pregnant women from the start of gestation to six months after birth and for children from birth to 5 years of age, including surgical operations, diagnostic tests, and medications. Maternal and child health, nutrition, and sexual and reproductive health programs are included in the insurance initiative as established benefits and are provided obligatorily at all public health and social security system establishments at the primary, secondary, and tertiary care levels and in private for-profit and nonprofit establishments that have joined under special agreements. In 2004, 314 of Bolivia's municipalities were being served through 2,259 care facilities in both rural and urban areas, with the services offered being based on local treatment capacity and available technology.

for those who were not affected by poverty. Out-of-pocket expenditures represented 6% of total household expenditure for families in the middle quintiles of income distribution, while in the wealthiest quintile these expenditures represented only 5.2%.

The social security system recorded the health sector's largest expenditures (35%, equivalent to US\$ 151.6 million), despite the fact that the system covers only 27% of the population and actual membership is less than 20%. The public health sector followed with 30%, equivalent to US\$ 130 million, and is responsible for financing public insurance programs and national prevention programs. Household out-of-pocket expenditures totaled US\$ 123.4 million, and the private sector (NGOs, the Church, and private insurance), with the lowest spending level, reported US\$ 32.5 million.

At the global level, 34% of households reported no out-of-pocket health care expenditures, 53% reported spending less than 10%, and 13% reported health care costs of more than 10% of total household expenses. Of these, 63% were urban households and 37% were rural households, indicating a greater income generation capacity among the urban population and, consequently, its greater ability to cover costs.

### **Technical Cooperation and External Financing**

From 2001 to 2003, credits and donations to the Ministry of Health and Sports budget represented 76% of the total budget and 24% came from the National General Treasury. During the 2001–2002 period, financial contributions from external cooperation totaled BO\$ 97,097,934 (1 Bolivian boliviano = US\$ 0.12), of which 71% represented concessional loans and 29% donations. In 2003, these increased to BO\$ 101,857,165, of which 81% were loans and 19% were donations.

The financial resources from donations and the transfer of external credit were allocated mainly to the “nonpersonal services” budget line item, which entails payments for the use, maintenance, and repair of third-party real estate and assets, and includes professional and commercial services. Of the total funds allocated from 2001 to 2003, 53.2% went to nonpersonal services, 21.8% to real assets, 21.6% to materials and supplies, 3% to personal services, and 0.4% to taxes, fees, and royalties.

The total amount disbursed under the heading of cooperation (including donations and loans) between 1998 and 2002 was US\$ 3 billion, of which US\$ 1 billion corresponded to the social area (health, education, basic sanitation, and rural development). The health sector spent 6% of all funds disbursed by international cooperation (US\$ 163 million) in the period under study, thereby becoming the sector with the least relative disbursement within the social area.

Since 1999, Bolivia has had a national policy of cooperation and international relations known as the New Relationship Framework. This policy was proposed during meetings of the Consultative Group on Bolivia sponsored by the World Bank and held in Paris with the goal of “organizing international support for the reduction of poverty levels” (28); under it, Bolivia was able to structure a state policy for governing its international cooperation relations and update it in 2005.

The policy's objective has been to significantly increase the effectiveness of cooperation activities which, combined with the local effort, will be able to more quickly decrease the poverty indexes and consolidate the levels of sustainable growth and development in the 21st century. The various international cooperation partners have developed initiatives and proposals to establish a framework for dialogue with their national counterparts:

- The United Nations Development Assistance Framework, UNDAF (29), and the Common Country Assessment, CCA, provide the planning framework for the U.N. system in Bolivia, through which the system's response is organized in order to achieve common development goals. It is also a resource planning tool and establishes methods for the monitoring and evaluation of this cooperation.
- The World Bank, in the context of the Country Development Framework, CDF, has framed a proposal to improve the efficiency of the international community's participation in development activities. The objective of this framework is a results-oriented approach to poverty relief (30) through the inclusion of macroeconomic and structural considerations within a comprehensive strategy.
- The Organization for Economic Cooperation and Development, OECD, has proposed, in the document *El Papel de la Cooperación Internacional para el Desarrollo en los Albores del Siglo XXI* (The Role of International Cooperation in Development at the Beginning of the 21st Century), a new strategy for the future based on well-defined roles to be played by the principal bilateral partners for development, taking into consideration comprehensive strategies that include economic, social, and policy elements.

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