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# PARAGUAY

## GENERAL SITUATION AND TRENDS

### Socioeconomic, Political, and Demographic Overview

Paraguay lies at the center of South America. It has two major rivers, the Paraguay and the Paraná. The Paraguay River divides the country into two distinct regions: the west, a relatively arid plains region, and the east, a more heavily populated and wealthier region.

In addition to the capital city, Asunción, the country is divided administratively into 17 departments, which in turn are subdivided into 264 districts. Paraguay has a presidential system of government, with an executive branch and a legislative branch, which consists of a bicameral legislature.

Paraguay's transition to democracy began in 1989 with the direct election of municipal governments. Since then, several events have strengthened the democratic process and helped the country withstand the military crisis in April 1996. These events include the adoption of a new Constitution, presidential elections in 1993, municipal elections in 1996, and the decision to hold presidential and departmental elections in 1998.

The country has a surface area of 406,752 km<sup>2</sup>. In 1997, the population was estimated at 5.1 million inhabitants, of which 40.3% were under 15 years of age, 56.2% were between the ages of 15 and 65, and 3.5% were 65 years of age or older. A high rate of growth of the population has been one of the defining characteristics of Paraguay's social development. Between 1950 and 1992, the country's population tripled; between 1982 and 1992, the average annual growth rate was 3.2%.

A downward trend has been noted in birth rates, which fell from 37.7 per 1,000 in 1972 to 33.8 per 1,000 in 1992. Infant mortality has also declined: from a rate of 53.1 per 1,000 in the 1970s to 43.3 per 1,000 in 1995.

Life expectancy at birth for males was estimated at 60.6 years in the 1950s. By 1996, it had increased to 68.1 years.

During the same period, life expectancy at birth for females rose from 69.1 to 71.9 years.

The total fertility rate at the national level was 4.5 children per woman during the period 1990–1995, down from the figure of 4.7 children per woman reported by the 1990 Survey of Reproductive Health.

The population density is 12.5 inhabitants per km<sup>2</sup>, with considerable variation among different regions in the country. The western, or Chaco, region occupies almost 61% of the total land mass, but only 2.5% of the population lives there. In the eastern region, the population is quite unevenly distributed; there are 4,200 inhabitants per km<sup>2</sup> in Asunción, while there are 350 per km<sup>2</sup> in the Central Department and only 15–45 inhabitants per km<sup>2</sup> in the departments of Guairá, Cordillera, Caaguazú, Alto Paraná, Paraguairí, and Itapúa.

According to data from the 1992 census, 50.3% of the population is urban and 49.7% is rural. Estimates for 1995, however, indicate that 53% of the population lives in urban areas.

An important factor in Paraguay's social organization is language. Spanish is used in formal education and as the official language, but Guaraní has been a central element in shaping the country's cultural identity. Moreover, teaching of Guaraní in primary and secondary schools has been mandatory since 1994. According to data from the Population and Housing Census of 1992, almost 40% of the country's population speaks only Guaraní and about 50% speaks two languages.

As a fairly new democracy, Paraguay faces many challenges, including the absence of an agrarian policy, low wages, high unemployment, scarcity of housing, elevated school dropout rates, unmet health needs for the most disadvantaged social sectors, and exacerbation of existing inequities. Wealth is still closely linked to land ownership. Agriculture and livestock-breeding continue to be the principal productive activities, although in the past few years there has been an attempt to diversify and open up markets beyond these sectors.

The Southern Common Market (MERCOSUR), which was launched in January 1995 and comprises Argentina, Brazil, Paraguay, and Uruguay, has drawn Paraguay into the global and regional integration processes under way. The creation of MERCOSUR, however, has come at a difficult juncture in Paraguay's history, opening up new opportunities, but posing some risks. The country is faced with the challenge of integrating into a highly competitive market with trading partners who are demographically larger and socially and economically stronger.

The country's economic mainstay is agriculture, particularly cotton and soybean production for export. The agricultural sector generates 26.7% of the gross domestic product (GDP), employs 35.8% of the economically active population, and produces 90% of registered exports. Of these exports, approximately half are raw materials. Nevertheless, in the 1990s the agricultural sector has scaled down, as compared with other sectors of the economy. For example, industry and construction now account for 21.6% of the GDP, and the service sector generates 51.7%. In addition, the country derives enormous financial and energy resources from the binational hydroelectric plants in Itaipú and Yacyretá.

In the early 1990s, GDP growth rates declined steadily, bottoming out at 1.8% in 1992. According to preliminary statistics, between 1993 and 1995, the annual GDP growth rate was 4.1%, 3.1%, and 4.7%, respectively, but in 1996 the figure again dropped to 1.3%. Inflation has remained at acceptable levels: 10.5% and 8.2% in 1995 and 1996, respectively, after having reached an annual level of 44% in 1990. This reduction has come at a cost, however, because anti-inflation policies are considered one of the main factors behind the slow GDP growth rate during the past several years.

In the area of foreign trade, the country has succeeded in reversing the downward trend of international reserves seen in the late 1980s. Nevertheless, the balance of trade remains negative, and the country's trade deficit has increased over the past five years as the gap between the volume of exports (US\$ 1,048 million in 1996) and imports (US\$ 2,658 million in 1996) has widened.

With an average annual per capita income of US\$ 1,634 (preliminary statistics for 1996) and social indicators that reveal deficits in health, nutrition, education, and housing, Paraguay ranks among the countries with medium levels of human development, based on the criteria applied by the United Nations Development Program to calculate the human development index.

The problem of unemployment in Paraguay has more to do with a shortage of jobs that pay a living wage than with open unemployment. It is estimated that three-fourths of rural workers are employed in family farming operations.

Data on unemployment from different sources are not consistent. According to the Central Bank, unemployment be-

tween 1992 and 1996 was approximately 9% and reached a level of 9.8% in 1996. In contrast, statistics from the Department of Industrial Policy within the Ministry of Industry and Commerce put unemployment at 13.7% for 1995. This figure reflects both open and concealed unemployment. Open unemployment (the proportion of job seekers who cannot find work) for that year was 5.3% in urban areas and 3.4% nationwide. Hidden unemployment (the proportion of people who, although they want or need to work, are not actively seeking employment because they believe that they will be unable to find a job that will meet their needs) reached 10.3% nationwide in 1995.

Women's participation in the labor market has increased steadily, as has the number of women obtaining higher levels of education.

According to recent studies, at least 30% of the population lives below the poverty line. This figure was obtained by estimating the cost of satisfying the food needs of each person, as well as other basic needs, and comparing it with individual or family income. In this way, a distinction is made between indigence or extreme poverty, which refers to the inability to satisfy essential food needs, and "basic poverty," which is the inability to meet all basic needs (food, clothing, housing, etc.). In rural areas, the percentage of people living under conditions of basic poverty is approximately 55%, and women and children are most often affected. Since the 1980s, levels of basic poverty have remained relatively stable in urban areas, although extreme poverty has increased from 15% to 21%.

Paraguay faces a serious housing problem. According to the 1992 National Population and Housing Census, more than half of all housing units are located in urban areas, with an average of 4.6 inhabitants per dwelling. In rural areas, the figure is five inhabitants per dwelling. The cumulative housing shortage amounts to more than 350,000 dwellings, and the annual unsatisfied demand for housing is around 15,000 units. Thirty percent of the population lives in conditions of overcrowding, which is defined as an average of three or more persons per room. As for the quality of housing, more than a third of dwellings have basic deficiencies, with marked differences between urban and rural housing. In urban areas, 23% of the housing is considered to have basic deficiencies, and in rural areas the figure is 49%.

As for literacy, 9.4% of Paraguay's population is illiterate (persons who are 10 years of age or older and have not completed the second grade are considered illiterate). The percentage is higher among females, with the exception of girls in the 10–14 age group, who have higher literacy rates than boys the same age. Illiteracy has shown a downward trend, dropping from 21% to 9.4% between 1982 and 1992, although the improvement has been less marked among females and among rural inhabitants. Primary school enrollment is as

high as 95%, but grade repetition rates are high (9% at the national level and 10.4% in rural areas), as are dropout rates. Only 51% of children who began the first grade in 1986 have completed the sixth grade.

### Mortality Profile

Based on records of registered deaths maintained by the Ministry of Public Health and Social Welfare, as well as the crude death rate computed by the Bureau of the Census, Statistics, and Surveys (5.43 per 1,000), underreporting of mortality is estimated at 38.7%. However, this national average conceals substantial regional variations. In 1995, in 37% of reported infant deaths, the child had received no medical attention. Of the deaths certified by doctors, the percentage attributed to ill-defined signs and symptoms was 10.3% in 1995.

The following figures on mortality rates are based on currently available data. This information reflects only deaths registered by the Ministry of Public Health and Social Welfare. The aforementioned percentage of underreporting should therefore be taken into consideration when interpreting the information.

In 1995, the Ministry of Public Health registered a total of 16,069 deaths. By cause, based on the groups of causes used in the PAHO publication *Health Statistics in the Americas*, diseases of the circulatory system accounted for 34.5% of the deaths, followed by malignant neoplasms and external causes, which accounted for 12% each. Communicable diseases accounted for 11.4% of the registered deaths, and 3.9% were due to conditions originating in the perinatal period. By age group, 12.6% of the total deaths occurred among children under 5 years of age, 2.1% among children aged 5–14, 18.9% among adults aged 15–49, 15.7% among persons aged 50–64, and 50% among people 65 years and older. In 1991, children under 5 accounted for 17.2% of all deaths, and adults 65 years and older accounted for 46.6%.

The mortality profile of the 18 health regions is fairly similar to the national profile. In 13 of the 18 regions, the leading cause of death is diseases of the circulatory system. Malignant neoplasms are either the second or third leading cause of death in 16 of the 18 regions. Likewise, external causes ranks as either the second or third cause in 12 of the regions. It is noteworthy that the leading cause of death in four of the regions (Alto Paraná, Amambay, Canendiyú, and Boquerón) is external causes.

Deaths due to accidents (codes E800–E949 in the International Classification of Diseases, 9th Revision) represent a significant proportion of total mortality. This group of causes accounts for 7 per 100 registered deaths, making it one of the primary causes of death in the country.

## SPECIFIC HEALTH PROBLEMS

### Analysis by Population Group

#### *Health of Children*

In 1995, 1,570 deaths were registered among children under 1 year of age; 43% were due to neonatal infections, pneumonia, influenza, diarrhea, meningitis, and tetanus. The infant mortality rate in 1991 was 24 per 1,000 live births. According to data from death certificates, this number decreased to 19.7 per 1,000 in 1995. Even when underregistration is taken into account, there are significant regional variations in the 1995 data, with rates ranging from 32.4 per 1,000 in Alto Paraná to 16.2 per 1,000 in Asunción.

In 1995, half of all registered deaths in the under-1 age group occurred during the first 28 days of life. The neonatal mortality rate was 9.8 per 1,000 live births; obstetric causes accounted for 38% of these deaths, neonatal infections for 18%, and prematurity for 15%. The postnatal mortality rate was 9.9 per 1,000 live births, and pneumonia, influenza, and diarrheal diseases were the principle causes of death. The mortality rate in the 1–4-year age group was 5.7 per 1,000 registered live births in 1995. The principal causes of death were pneumonia, diarrhea, and accidents.

The only data available on morbidity rates are figures registered by health care facilities of the Ministry of Public Health, which suffer from deficiencies in coverage and quality. For the under-5 age group, 1995 data indicate that the leading cause of medical visits was acute respiratory infections, which generated 146,971 visits. Other important causes included acute diarrheal diseases (30,729), parasitic diseases, (27,421), and anemia (16,652).

In 1995, 147 deaths were registered in the age group 5–9 years old, of which 55% were males. The first, second, and third causes of death were external causes (ICD-9, E800–E999), which accounted for 30% of the total; respiratory diseases (ICD-9, 460–519), which accounted for 13%; and malignant neoplasms, which accounted for 10%.

Among external causes, traffic accidents accounted for one of every three deaths and firearms accounted for 14%.

With regard to morbidity rates, in 1995 the principal reasons for medical visits among children aged 5–9 in establishments of the Ministry of Public Health were acute respiratory infections, parasitic diseases, anemia, accidents, and diarrheal diseases.

#### *Health of Adolescents*

In 1995, 529 deaths were registered in the age group 10–19 years old. The leading cause of death was external causes,

which accounted for 53%, followed by malignant neoplasms, which accounted for a much smaller proportion (6%). Traffic accidents accounted for 23% of the deaths due to external causes. While there are no significant sex differences in mortality in the 10–14 age group, 79% of those who died in the 15–19 age group were males.

In 1995, the primary reasons for medical visits in Ministry of Public Health establishments by persons in the 15–19 age group were acute respiratory infections, anemia, accidents, and parasitic diseases.

Drug addiction, alcoholism, and juvenile delinquency are serious problems among young people. These problems are associated with urbanization and marginalization in urban areas.

### *Health of Adults*

More than half the country's population (53%) is between 15 and 60 years of age and 28% of all deaths occur in this group. The percentage of male deaths in this group is 62% and that of females is 38%.

The leading causes of death among adults, particularly those aged 15–44 years, are accidents, homicides, and some infectious diseases such as tuberculosis and Chagas' disease. Among women aged 15–49, the principal causes of death are malignant neoplasms, accidents, and heart disease.

In 1995, there were 104 registered maternal deaths, 29% due to abortion and 24% to sepsis. Additional significant causes were "other complications of pregnancy, childbirth, and the puerperium," toxemia, and hemorrhage, in that order.

In the 45–64 age group, the leading causes of death in 1995 were cardiovascular diseases and accidents.

In 1995, the most common reasons for medical consultation in this age group were acute respiratory infections, anemia, accidents, and hypertension.

### *Health of the Elderly*

The group (65 years old and older) makes up 5.2% of the total population and accounts for 56% of total deaths. The primary causes of death in this group in 1995 were cardiovascular diseases (ICD-9, 391–398; 410–429; 441–459), which accounted for 28%; cerebrovascular disease (ICD-9, 430–438), which accounted for 18%; malignant neoplasms (ICD-9, 140–239), which accounted for 13%; diabetes (ICD-9, 250), which accounted for 6%; pneumonia and influenza (ICD-9, 480–487), which accounted for 4%; and hypertension (ICD-9, 401–405), which accounted for 3%.

In this age group, the leading reasons for medical visits at Ministry of Public Health establishments were hypertension, acute respiratory infections, anemia, and accidents.

### *Health of Women*

In 1995 the maternal mortality rate was 130.7 per 100,000 live births. In Paraguay, discrimination against women persists and affects all women, but especially those in the lowest economic strata. Of every 10 illiterate persons, 6 are women. More than one-fifth of all households are headed by women. Women have little power in the political sphere, as evidenced by the fact that 94% of the members of the National Congress are men, and only one government minister is a woman. Only 3.2% of the recipients of development loans and grants are women.

The majority of women work in unpaid jobs that are not reflected in official employment statistics (family farming, housekeeping, child care, care of the elderly and disabled). Those who do have paid jobs receive lower wages than their male counterparts who perform similar work. In almost all domestic violence cases, the victims are women and children.

Through the Secretariat for Women's Issues, which was created in 1994 and has ministerial status, the Government implements programs that target gender-related issues (violence against women, reproductive health and family planning, sex education, job training, etc.).

### *Workers' Health*

There is no specific institution responsible for workers' health, and no studies of work-related health risks have been undertaken. Nevertheless, the Ministry of Public Health and Social Welfare, the Ministry of Justice and Labor, and the Social Security Institute (IPS) coordinate activities related to health and safety in the workplace through the Occupational Health and Safety Council.

No reliable data on occupational illnesses are available. There is a shortage of professionals specializing in occupational health and no technical and legal provisions under the health and labor codes regulating conditions in the workplace.

According to data from IPS, which refer only to its beneficiaries, in 1989 there were a total of 2,174 work-related accidents or illnesses, resulting in a rate of 22.1 cases per 1,000 beneficiaries. In 1993, 4,097 cases were registered, which increased the rate to 29.6 per 1,000.

### *Health of the Disabled*

A lack of information, coupled with problems relating to coverage and definitions, make it difficult to adequately assess the situation of this group. According to data from the 1992 census, in Asunción there were 5,335 persons with some kind of disability, while the figure for the entire Central Department was 7,786.

The National Institute for the Protection of Exceptional People (INPRO) was created under Law 780, enacted on 30 November 1979. Since 1985, the Institute has been providing diagnostic, treatment, and rehabilitation services for the disabled. As of 1995, with the goal of extending the coverage of its services, INPRO integrated all governmental and non-governmental agencies working in the area of disability to which the institute provides technical and financial assistance. That same year, a community-based rehabilitation program was implemented. The program includes extrainstitutional care for the disabled and is being extended to other parts of the country. According to INPRO statistics, there are 22,000 disabled persons nationwide.

### *Health of Indigenous People*

During the last quarter of this century, as a result of migration and occupation and settlement of indigenous lands, the traditional habitat of indigenous peoples has steadily shrunk and deteriorated. Despite efforts of private organizations and the National Institute of Indigenous Peoples (INDI), indigenous communities have deeply deteriorated and disintegrated.

According to data from the 1992 national census, the indigenous population totaled 49,500, of which 43.8% were under 15 years of age and 2.7% were 65 and older. The indigenous population comprises five groups (Tupí Guaraní, Mataco-Mataguayó, Guaicurú, Lengua-Maskoy, and Zemuco) and 17 ethnic subgroups.

The total fertility rate in the indigenous population averages 5.7 children per woman, with differences between ethnic groups ranging from 3.7 for the Lengua group to 7.8 for the Aché ethnic group.

The infant mortality rate—calculated by using the Coale-Trussel variant of the Brass method and based on 1992 census data—was 106.7 per 1,000 live births for the indigenous population as a whole. Interethnic differences ranged from 64 per 1,000 for the Maká to 185 per 1,000 for the Chamacoco.

In addition to having the highest infant mortality rate in the country, the indigenous population has the highest rate of tuberculosis—10 times the national average. Almost 80% of indigenous households are infested with *Triatoma infestans*, a vector of Chagas' disease.

### **Analysis by Type of Disease**

#### *Communicable Diseases*

**Vector-Borne Diseases.** Malaria persists as a health problem, although the number of cases has remained stable over the past three years, never exceeding 1,000. Up to 90% of the

cases, all of them due to *Plasmodium vivax*, are concentrated in eight districts within the departments of Alto Paraná, Caaguazú, and Canendiyú.

Since the dengue epidemic of 1988–1989—which was caused by serotype 1 and resulted in more than 40,000 cases—no new cases have been reported, although the vector, *Aedes aegypti*, is present throughout the country.

Chagas' disease is the most serious vector-borne disease in Paraguay and one of the country's important public health problems. Estimates by the Intergovernmental Commission for the Elimination of *Triatoma infestans* and the Commission for the Interruption of Transmission of American Trypanosomiasis by Blood Transfusion indicate that the prevalence of *Trypanosoma cruzi* infection in Paraguay is 11.6%. This percentage is diminishing as a result of control activities. In 1986, 98% of blood used for transfusions was serologically tested, and the prevalence of *Trypanosoma* antibodies in donors' blood was found to be 5.7% and 4.1%, respectively, for 1995 and 1996. A prevalence of 15% was found in a study of 5,042 pregnant women conducted in 1995 in the departments of Paraguari and Cordillera. Some surveys of the Chaco indigenous population have found up to 80% serologic prevalence.

Cutaneous leishmaniasis is also a serious public health problem. There are approximately 1,000 cases each year, although there is significant underreporting and there is an annual variability that can be explained not by epidemiologic hypotheses but by notification problems. In the past few years, 85% of the cases have occurred in three departments: Canendiyú, Alto Paraná, and San Pedro. The presence of cases and the increase in their number is related to the development and settling of new agricultural lands. Consequently, the most affected population consists of males over the age of 20.

**Vaccine-Preventable Diseases.** Measles has decreased dramatically in recent years. Up to 1993, epidemics occurred every three years, causing 2,000 cases annually, but between 1993 and 1996 the number of cases dropped from 2,066 to 142 to 69 to 13, respectively, for each year in that period. In May 1997, however, there was an outbreak that mainly affected the department of Alto Paraná, whose most populated cities—Ciudad del Este, Presidente Franco, and Hernandarias—border Brazil. By the end of 1997, more than 300 cases had been reported, 180 of which were confirmed through laboratory analysis or epidemiologic investigation. The last case of poliomyelitis occurred in 1985. In 1995, 23 cases of acute flaccid paralysis were investigated, and between January and October 1996, 19 cases were investigated. Wild poliovirus was ruled out in all cases. During 1992–1995, the numbers of cases of neonatal tetanus were 18, 28, 18, and 16, respectively. As of October 1996, eight cases had been reported. One case of diphtheria was reported in 1995 and none in 1996. Cases of whooping cough totaled 372 in 1992 and

272 in 1993. In 1994, the number dropped to 49, and in 1995 and 1996, only 13 and 16 cases, respectively, were reported.

**Cholera and Other Intestinal Diseases.** Since the cholera epidemic began in the Americas, Paraguay has reported seven cases: three in 1993 and four in 1996. All cases were laboratory confirmed and all were caused by *Vibrio cholerae* 01, biotype El Tor, serotype Inaba.

Between 1992 and 1996, public health services reported around 40,000 cases of diarrhea per year. Both the number and the proportion of cases in persons under and over the age of 5 years remained about the same during that period (80% of the cases occurred in children under age 5 and 20% in the rest of the population).

**Chronic Communicable Diseases.** Tuberculosis continues to be a serious public health problem, particularly among indigenous and rural populations. The disease mainly affects adults 15 years old and older. In 1992 and 1993, the annual incidence was 43.3 per 100,000 population; in 1994, it was 38.4; in 1995, 36.1; and in 1996, 37.2. Of these cases, 95% were the pulmonary form; 45% of the cases that occurred in 1995 were confirmed by sputum smear microscopy. Case reporting continues to be incomplete and irregular, especially cases confirmed by bacteriological analysis, and the figures do not reflect the true magnitude of the problem. The most recent cohort studies show cure rates of around 70% and treatment abandonment rates of 17%.

Between 1992 and 1996, the number of new cases of leprosy remained relatively stable; 365, 338, 376, 227, and 386 cases were reported for each year of that period. The national prevalence rate is 2.5 per 10,000, although there are problems with underreporting. The departments with the highest rates are Alto Paraguay, Amambay, and Canendiyú.

**Acute Respiratory Infections.** Acute respiratory infections continue to be the principal reason for medical consultation. In 1995, they were the leading cause of death in the age group 1–4 years old, and they accounted for 14.5% of all reported deaths of children under 5 years. Between 1991 and 1996, 200,000 cases were reported annually.

**Rabies.** The incidences of canine rabies in Paraguay increased from 227 cases in 1994 to 572 cases in the period between January and October 1996. In 1992, there were three cases of human rabies; in 1996 there were six cases. In 1995, more than 15,000 people sought medical attention because they were at risk of contracting rabies. Canine rabies occurs most frequently in the central part of the country. The Central, Paraguari, and Caaguazú departments accounted for 90% of reported cases; the Central Department accounts for 80% of those cases.

**AIDS and Other STDs.** Between 1986 and December 1996, a total of 253 cases of AIDS were reported in Paraguay, with a case fatality rate of 57%. During the first four years of the epidemic, the annual mean number of cases remained under 10. During the next five years, about 20 cases were reported per year, and during the last four years, the yearly average was 35. The annual incidence rate is 1 per 100,000 population.

The age groups most affected by AIDS are those between 30 and 34, followed by those between 35 and 39. More males than females are affected; the disease is becoming increasingly frequent among women, however. The first female case of AIDS was registered in 1990—five years after the first case was reported nationwide. Since then, there have been approximately 10 new cases of AIDS in women each year.

In 66% of the cases, exposure to the virus has been through sexual contact. Early in the epidemic most cases occurred among homosexuals, but in recent years many heterosexuals have been affected. About 12% of cases acquired the virus through intravenous drug use, 3.8% through blood transfusions, and 2.9% through perinatal transmission.

Available information on HIV infection indicates that persons between the ages of 20 and 24 constitute the group at highest risk. According to data from the National Blood Transfusion Center, the prevalence of HIV infection in blood donors is 0.2%.

The number of cases of syphilis remained relatively constant between 1988, when 763 cases were reported, and 1990, when 765 cases were reported. In 1992 the number of reported cases climbed to 1,022. Rates have not fluctuated much since then. In 1995, the Ministry of Public Health recorded 1,016 cases, of which 263 (26%) were diagnosed in pregnant women, and 56 (5.6%) were cases of congenital syphilis. As of October 1996, 683 cases of syphilis had been reported. The same year, only 66% of blood for transfusions were subjected to serologic testing with the VDRL test. The prevalence of seropositivity among donors was 3.4%.

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

**Nutritional Diseases and Diseases of Metabolism.** Protein-energy malnutrition is not a serious problem in Paraguay. However, deficiency disorders, such as anemia, endemic goiter, and some vitamin deficiencies, are common, especially in the lowest-income population. According to a 1993 height-for-age survey, the prevalence of malnutrition in schoolchildren was 10.3% nationwide. The rate was twice as high in rural areas, and in public schools the rate was three times that found among students in private schools. The lowest rate (3.7%) was found in Asunción, and the highest

(15.3%) was in the department of Canendiyú. In 1995, 88 deaths due to nutritional diseases, vitamin deficiency, and anemia (ICD-9, 260–269; 280–285) were registered, 33 of which were deaths of children under 5.

**Cardiovascular Diseases.** In 1991–1992, the Institute for Health Sciences Research at the National University of Asunción conducted a study to analyze the prevalence of certain risk factors for cardiovascular disease. The sample consisted of 1,606 people of both sexes who were between 20 and 70 years of age and lived in Asunción or the surrounding metropolitan area. Results showed that the prevalence of diabetes was 6.1%, while that of glucose intolerance was 11.5%; 11.5% of the study population (9.5% of the men and 12.4% of the women) had high blood pressure and 17.2% of the men and 10.4% of the women had elevated triglyceride levels. Of the total study population, 53.8% were obese (45.8% of the men and 57.4% of the women) and 40% had a sedentary lifestyle, with higher prevalence among women aged 30–49.

In 1995, diseases of the circulatory system (ICD-9, 390–459) accounted for 5,537 deaths. Of these, 2,013 were due to cerebrovascular disease (ICD-9, 430–438), 1,573 to acute myocardial infarction and ischemic heart disease (ICD-9, 410–415), and 319 to hypertensive disease (ICD-9, 401–404). Of the 5,537 deaths due to these causes, 4,535 (82%) occurred in the age group older than 60 years.

**Malignant Neoplasms.** In 1995, malignant neoplasms (ICD-9, 140–239) accounted for 1,930 deaths, representing 12% of all deaths that year. Mortality from this cause for both sexes was 40 per 100,000 population—46 per 100,000 for females and 33 for males. Among women, the largest numbers of deaths were due to malignant neoplasm of the uterus and uterine cervix (12 per 100,000), breast (5 per 100,000), and stomach (4 per 100,000). For men, the highest death rates were from malignant neoplasm of trachea, bronchus, and lung (7 per 100,000) followed by prostate and stomach (each at 5 per 100,000).

Among women, cancer of the uterus and uterine cervix, breast, and stomach, and leukemia, in that order, are the four leading causes of death from malignant neoplasms, accounting for 49.7% of all female deaths from that cause. Of the 295 deaths attributed to malignant neoplasm of the uterus and cervix, 120 originated as cervical cancer and 25% occurred in women under 45 years of age.

In men, the four leading causes of death from this cause were cancer of the respiratory system, prostate, and stomach, and leukemia, which together accounted for 59% of all male deaths from malignant neoplasms.

**Accidents and Violence.** Accidents and violence are an important cause of death and hospitalization. Traffic accidents are

the most frequent type of accident and rank ahead of work-related and domestic accidents. In 1995, 58% of deaths due to accidents and violence occurred in the 15–24 age group and 24% were in the 25–44 age group; in 80% of these deaths, the victims were males.

In the first four months of 1995, the number of deaths due to traffic accidents increased by 40% compared with the first four months of 1994. Whereas 93 people died in 1994, in 1995 the number of deaths totaled 130. A total of 461 and 761 accidents were reported in 1994 and 1995, respectively.

In Alto Paraná, accidents are the second leading cause of death and homicide is the third. One of every five homicides in the country takes place in Alto Paraná.

In 1995, 515 deaths due to homicide (ICD-9, 960–969) were recorded, which was 3.2% of all registered deaths; 91% of the homicide victims were males.

**Behavioral Disorders.** In 1991, a study on mental health and substance use habits was conducted. The study population consisted of persons aged 12–45 years who resided in the 10 most populated cities in the country. The study detected abuse of sedatives, hypnotics, or stimulants in 10.3% of the sample and abuse of amphetamines in 4.6%. One-third (32%) of those surveyed smoked or had smoked; of this proportion, 14% smoked on a regular basis, and 10% smoked more than 10 cigarettes per day. The prevalence of marijuana use was 1.4%; that of cocaine use was 0.3%; and that of use of analgesics for nontherapeutic purposes was 3.0%. Inhaled substances were used by 2.5% of the sample, and 6.6% used sedatives without a medical prescription. The most frequently used substances with the highest potential for addiction were alcohol and pain killers.

In 1995, 121 deaths due to suicide (ICD-9, 950–958) were registered; 70% were males.

**Oral Health.** A study was carried out in 1995 to determine the DMFT (decayed, missing, filled teeth) index, but the results are not yet available. According to studies conducted in 1989, the most common oral health problem is dental caries, which affects 98% of schoolchildren and 100% of adults.

**Hantavirus Pulmonary Syndrome.** In November 1995, several clinical cases of respiratory problems, as well as asymptomatic infection with the Sin Nombre strain of Hantavirus, were found in adults living in the city of Filadelfia, located in the center of the Chaco Region. Of 24 possible cases, 23 tested positive for antibodies, as did 4 of 27 contacts and 44 of the 345 residents in the locale. *Calomys laucha* was the most frequently captured rodent as well as the species with the highest rate of antibodies to the Sin Nombre virus.

## RESPONSE OF THE HEALTH SYSTEM

### National Health Plans and Policies

The National Constitution adopted in 1992 identifies health as a basic right of all citizens and establishes that the National Health System will carry out integrated health actions, with policies that will promote joint formulation and coordination of programs and services by the public and private sectors.

The national health policy seeks to respond to the population's health needs through coordinated actions of public and private sector institutions. It assigns priority to maternal and child health and nutrition; control of vaccine-preventable diseases, communicable diseases, and zoonoses; environmental health; strengthening of health services; interinstitutional coordination; community participation in the health system; and care for marginal populations and indigenous communities.

In December 1996, the Congress adopted Law 1,032, which creates a National Health System. The system basically aims at delivering services to all people in an equitable, timely, and efficient manner—without discrimination of any kind—in the areas of health promotion, recovery, and rehabilitation. The system establishes inter- and intrasectoral links and incorporates all institutions that were created for the specific purpose of participating in health activities.

### *Health Sector Reform*

The National Health System Law is part of the strategy for health sector reform. This law incorporates the principles of equity, quality, efficiency, and social participation. Its implementation began with a process of decentralization at the departmental and regional levels, as well as with the execution of two projects funded by the World Bank and the Inter-American Development Bank (IDB), which sought to strengthen health services in the 11 departments where 71% of the population resides.

The principal strategies of the Ministry of Public Health and Social Welfare are the following: to establish a national health care system that complements and coordinates the entities responsible for developing health activities, with a view to improving care and increasing the coverage of services; to put into action the national government's decentralization policies through ongoing implementation of departmental and district health councils; to strengthen local health systems, which, in turn, will strengthen self-management of the different levels of health care and help optimize the use of available local resources; and to create the National Health Data Center, an agency of the Ministry of Public Health and Social Welfare whose primary purpose will be data collection and processing to facilitate management of

the health sector. The private sector will also be involved in this project.

### Organization of the Health Sector

#### *Institutional Organization*

The National Health Council is responsible for the coordination of health sector activities. The Council is made up of key health institutions and is headed by the Ministry of Public Health and Social Welfare. By law, it is responsible for coordinating and overseeing the plans, programs, and activities of both public and private health institutions.

Health care is the responsibility of three subsectors. The public subsector comprises the Ministry of Public Health and Social Welfare, the military health services, the police health services, municipal health services, the Sanitation Works Corporation, and the teaching hospital of the National University of Asunción. The semipublic subsector is made up of the IPS, the Paraguayan Red Cross, and the Our Lady of Asunción Catholic University Hospital. The private subsector is composed of multiple private medical centers, pharmaceutical laboratories, and pharmacies, linked together under the Association of Private Hospitals, Sanatoriums, and Private Clinics. The private subsector has grown tremendously in the past 10 years.

It is the Ministry's legal responsibility to ensure care for the population not covered by other institutions, particularly the most vulnerable and the lowest-income groups. Of this population, which makes up between 60% and 65% of the total, 40% has no coverage and is concentrated in rural and periurban areas.

Of the total national population, the Ministry of Public Health covers 63%; private services, 15%; the military health services, around 3%; the police health system, less than 1%; and the teaching hospital at the National University of Asunción, approximately 5%. IPS covers about 13% of the population for risks associated with occupational illnesses, accidents, disability, and old age. Both the Ministry and IPS are organized in a regionalized system with various levels of complexity. Municipal health services are responsible for public health activities such as refuse collection, public sanitation, and others.

#### *Organization of Health Regulatory Activities*

Health Code 836/88 recognizes the Ministry of Public Health as the highest public authority in matters of health and social welfare. The Ministry's Department of Health Surveillance is charged with registering and marketing drugs. However, the Department is staffed by few professionals, who

are responsible for all administrative processes involved in registering products and licensing health establishments, including all the pharmacies in the country.

The Ministry of Public Health maintains a quality control system under an agreement with the National University of Asunción and its Center for Multidisciplinary Technological Research. This center conducts quality control testing of drugs before they are marketed, as well as post-marketing analysis, if so requested by the Ministry pursuant to a routine inspection or submission of a complaint. Paraguay is currently in the process of implementing the MERCOSUR rules and regulations for quality control of pharmaceutical products and verification of good manufacturing practices.

Reporting of communicable diseases has been mandatory for all public, private, and social security health services since 1915; however, in practice, reporting is limited to public services and, to a certain degree, those of IPS. The Ministry of Public Health, through the Department of Epidemiology, is responsible for compiling disease reports. Weekly reporting is required for 40 diseases and health events. Of these, 16 are under intensified surveillance, and any suspected cases must be reported immediately. HIV/AIDS and Hantavirus pulmonary syndrome are the two diseases most recently incorporated into the system. Epidemiological surveillance results are published in a quarterly epidemiological bulletin. Health inspection of ports, airports, and ground transportation terminals—which is carried out by various agencies of the Ministry of Public Health—is also part of the surveillance system.

The National Food and Nutrition Institute (INAN), an agency of the Ministry, was created in May 1996 and is responsible for food safety and quality control at the national level. The creation of this agency, coupled with coordination of control activities by the National Food Safety Commission (made up of representatives of the ministries of Public Health, Agriculture, and Industry and Commerce) and the integration of Paraguay into MERCOSUR, has substantially enhanced food quality control in Paraguay.

## Health Services and Resources

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

**Health Promotion.** The Ministry carries out health education and communication activities to support the programs on AIDS, cholera, family health, infant survival, prevention of drug and tobacco use, nutrition, and adolescent health. However, the national scope of these programs has not been evaluated.

In March 1997, agreements were signed with 10 *municipios*, including Asunción, for the development of a healthy communities strategy.

Knowledge about how to maintain good health and how to prevent illness and accidents is limited because of lack of information and education. Health education programs do not reach every corner of the country because of shortages of human and financial resources. In addition, at the health services level, little emphasis is placed on health promotion.

Research on health education and communication is limited, and there is little coordination between the social sectors for coordination and implementation of joint programs.

**Drinking Water and Sewerage Services.** In 1996, 48.3% of the urban population and 18.3% of the rural population had access to drinking water, with an average coverage nationwide of 27.1%. The availability of sewerage systems nationwide is 14.8%. In the interior, only two localities have a sewerage system. Coverage is concentrated in Asunción, where half the population has access to such systems. There are no systems in 11 of the country's departments, and in the remaining 6, coverage is under 10%.

The sewerage system in Asunción discharges wastewater directly into the Paraguay River at a mean rate of approximately 1.5 m<sup>3</sup>/sec. The volume of wastewater discharge is not expected to reach a high-risk level of 5.0 m<sup>3</sup>/sec until the year 2000. The discharge has an approximate dilution of 1/2,000, which eliminates the need for treatment plants. The same is true of other units that also discharge wastewater into the Paraguay River. Nevertheless, if population growth and industrialization continue at their current pace, the river could become extremely polluted.

**Environmental Quality.** The situation with regard to the environment and natural resources is characterized by rapid deforestation, loss of biodiversity, and deterioration of the ecosystem, with erosion of the soil in the eastern region and salinization in the western region resulting in the loss of fertile land. Various natural ecosystems and animal and plant species are in danger of extinction. Moreover, this environmental degradation is destroying indigenous habitats, which in turn leads to loss of cultural identity. There is a serious problem with surface- and underground water pollution—the result of poor management of solid, liquid, industrial, and domestic waste—as well as air pollution, which is mainly due to motor vehicle emissions and industrial activities. The most outstanding environmental problems are those linked to development of new agricultural lands, human settlements, and the hydroelectric plants in Itaipú and Yacyretá.

Air pollution is a relatively minor problem, but it is becoming more serious in some cities, especially Asunción, as a result of increased industrialization and motor vehicle traffic.

The country has an Environmental Health Program, in which all the institutions with responsibilities in the area of the environment, water, and sanitation participate. The pro-

gram's main components are drinking water supply and excreta disposal; pollution control; improvement, monitoring, and control of water quality; and sanitary waste disposal.

The Sanitation Works Corporation, an agency of the Ministry of the Interior, is responsible for providing drinking water, sewerage, and storm drainage services for communities with more than 4,000 inhabitants; communities with 4,000 or fewer inhabitants are served by the National Environmental Sanitation Service.

The Ministry of Agriculture and Livestock regulates the use of water resources. Once a year, analyses of heavy metals and pesticides are conducted, mainly in the Paraguay River, which is the main source of drinking water for the city of Asunción. A special laboratory detects pollution produced by alcohol factories.

Funding for environmental protection activities comes from water and sewerage service fees, taxes on alcoholic and nonalcoholic beverages, real estate taxes, and loans from banks and international organizations.

The National Environmental Sanitation Service plans, establishes standards, develops projects, and constructs works for water supply and excreta disposal systems. The services are administered by local sanitation boards.

#### *Organization and Operation of Personal Health Care Services*

Since 1990, the 18 health regions have been strengthened through increased financial and human resources and through decentralization; these improvements have given them greater autonomy and better operating capabilities. Services are structured on four levels. The first, or primary care level, provides for the basic needs of rural, isolated, or remote communities with fewer than 1,000 inhabitants. It consists mainly of health posts staffed by health volunteers, nursing auxiliaries, and birth attendants. The secondary, or basic, level provides care of moderate complexity for rural and periurban communities with populations between 2,000 and 20,000. The second level consists of health centers with a few beds (6–19) and a health care team that includes doctors; dentists; biochemists; pharmacists; nurses; obstetricians; health inspectors; and technical, administrative, and auxiliary personnel. The tertiary, or basic complementary, level is responsible for meeting more complex needs through general medical services and some specialized services. It consists of hospitals and regional health centers. The fourth, or specialized, level provides comprehensive care in specialized areas and serves as a referral center for the network of regional health services. Its principal resources are the National Hospital, the Cancer and Burn Hospital, the Juan Max Boettner Sanatorium, the Urgent Care Hospital, and the Central Laboratory and Institute of Tropical Medicine.

The health sector has no plan for coordinating the development of the operating capacity of its various institutions. Each one functions independently, which leads to duplication of services in the country's principal cities. In 1996, the physical resources of the public, private, and semiprivate sectors consisted of 1,140 establishments, including 47 hospitals, 25 regional hospitals, 197 health centers, 657 health posts or infirmaries, and 214 clinics and sanatoriums. Of the 1,140 establishments, 706 were administered by the Ministry of Health, 100 by IPS, 65 by the military health services, 23 by the police health services, 2 by the National University, 2 by the Catholic University, and 1 by the Red Cross; 241 were private.

The Ministry has 10 specialized hospitals, 15 regional hospitals, 137 health centers, and 477 health posts. IPS maintains 1 central hospital, 7 regional hospitals, 22 health centers, and 70 health posts. The military health services consist of 1 central hospital, 3 division hospitals, 35 health centers, and 26 infirmaries. The police health services include 1 central hospital and 22 infirmaries. The National University of Asunción has a teaching hospital and a neuropsychiatric hospital. The Catholic University has two hospitals—one in Asunción and the other in Villarrica.

The total number of hospital beds is estimated at 6,655, of which 2,905 are in establishments of the Ministry of Health, 1,816 in the private sector, 1,118 in IPS institutions, 539 in the teaching hospital of the National University of Asunción, 187 in the armed services hospital, and 90 in the police hospital.

In 1995, a total of 2,544,482 medical visits and 94,696 hospital discharges were registered in establishments administered by the Ministry of Public Health; 45% of the discharges were of women admitted for childbirth. The bed occupancy rate was 45%. According to data from the Ministry, in 1995 physicians attended 40% of the births that occurred in the Ministry's establishments; another 40% were attended by nurses or midwives, 16% by traditional birth attendants, and 4% by other personnel.

In 1995, there were 311,029 prenatal visits in Ministry of Public Health establishments; 30% were attended by physicians, 38% by nurses or midwives, and 32% by auxiliary personnel.

There are several centers that offer diagnostic imaging services, but it is not known whether they meet safety standards.

Considerable progress has been made in screening blood products and blood used for transfusions, thanks to strengthening of the National Center for Blood Transfusions. By law, all blood must be screened for HIV infection, Chagas' disease, syphilis, and hepatitis B; screening for hepatitis C is currently being undertaken. Through a strategy of providing staff training and a timely supply of reagents, the barriers to effective control of public and private blood banks are being overcome.

There is a shortage of mental health professionals, including psychologists with clinical experience, especially in rural areas.

There is also a lack of postgraduate courses in psychiatry. The scarcity of mental health units and services in general hospitals and health centers makes this one of the least-developed areas.

There are no mechanisms for maintaining up-to-date information on the number and complexity of health establishments and on the equipment they house.

With regard to services for the elderly, there is a national plan under the supervision of Social Welfare. The plan is based on interinstitutional and intersectoral coordination and incorporates social and community programs for older adults, societal motivation and sensitization programs, a program to support and strengthen institutions that provide services for the elderly, and a program to develop and modify related legislation.

### *Inputs for Health*

The national pharmaceutical industry (or pharmaceutical companies located in the country) is in an initial stage of development and is mainly geared toward the formulation, processing, packaging, and other activities related to the final preparation of pharmaceutical products. All the raw materials are imported. The country has no chemical-pharmaceutical industry.

In November 1996, the Senate approved a law for quality control of pharmaceuticals, cosmetics, domestic cleaning products, and similar products. The law is still being reviewed in Congress.

A national list of essential drugs has been developed based on the International Nonproprietary Names and essential drugs list of WHO. This list is used as a guide for the procurement and use of drugs in health services.

Purchases of drugs are currently funded through budget allocations from some local governments. The items are procured through a competitive bidding system coordinated by the Ministry of Public Health. For information and training, there is the National Pharmacopeia, which was adopted in 1943 and has not been updated. However, in practice, the United States Pharmacopeia (USP) is used as a reference.

Community pharmacies have been established in the country with initial funding from the Ministry of Public Health and Social Welfare, which facilitates access to essential drugs at low cost.

### *Human Resources*

According to data from the Ministry, in 1995 the country had 3,730 physicians, 1,279 dentists, 433 professional nurses, 1,547 licensed midwives, 1,875 pharmacists, 892 biochemists, 96 licensed social workers, and 1,561 psychologists.

Of a total of 5,226 people employed in 1995 in services administered by the Ministry of Public Health, 13% were physicians; 3.7%, dentists; 1.2%, biochemists; 9.5%, nurses or midwives; 8%, technical personnel; 37%, nursing auxiliaries; and 25%, administrative or service personnel. The distribution of Ministry personnel by health regions was fairly uniform, although in 5 of the 18 health regions there was a marked shortage of doctors in relation to the size of the population.

Most of the country's oral health professionals are in private practice, including dental assistants and a large number of dental technicians, who make prostheses, crowns, and other dental apparatuses. In the public sector, in 1995 the Ministry of Public Health employed nearly 200 dentists, more than half of whom were in Asunción and the Central Department, where 34% of the population lives. In 8 of the 18 departments there is a serious shortage of oral health personnel.

The Ministry of Public Health has stressed training for personnel in hospital administration, statistics, epidemiology, public health, and maternal and child health as well as training for technical and auxiliary personnel. In addition, a process of redistributing personnel and improving compensation and benefits based on performance and productivity has been implemented. Nevertheless, there are serious flaws in the strategy as well as problems in planning training activities and supervising educational processes.

### *Research and Technology*

With financial backing from international organizations, the National University of Asunción, through the Institute for Health Sciences Research, participates in basic and applied biomedical research.

University programs generally do little to encourage scientific research, and research methodology courses are insufficient. There is no information system through which scientific knowledge is compiled and research is disseminated. Most health studies are merely descriptive.

Scientific and technological research activities are carried out mainly in response to specific events and not as the result of an explicit policy. In addition, there is little financial support, minimal institutional structures, and a marked lack of human resources for such research; consequently, technological production and knowledge are scarce.

### *Expenditures and Sectoral Financing*

Of total health spending, 20% comes from the overall national budget. IPS contributions represent 26%, and direct expenditures by the population account for the remaining 54%.

Public expenditure for health as a percentage of GDP in 1990–1993 was 1.2%. Between 1984 and 1995, the share of the Ministry of Public Health and Social Welfare in the national budget ranged from a low of 4% to a high of 7.5%. Lack of information makes it impossible to accurately estimate the share of private and IPS spending.

In 1996, 64% of the financing for the Ministry's budget came from the Treasury, 14% from revenues of the Itaipú hydroelectric plant, 6% from resources of the Ministry itself, 6% from foreign credit, 5% from special resources, and 5% from other resources.

Income from private prepayment systems totals approximately US\$ 26 million annually, which is 13% to 15% of public sector spending.

IPS is financed through the trilateral support of employers, workers, and the State. In addition, IPS receives income from investment of reserve funds, contributions to the special system, contributions of pensioners and retirees, and proceeds from surcharges, penalties, etc. Workers contribute 9% of their earnings, employers contribute 14% of the amount paid to their employees, and the State contributes 1.5% of the taxable wages that firms pay their workers. Under the special system, public- and private-sector teachers, university professors, independent contractors, and domestic workers contribute 8% of their earnings.

### *External Technical and Financial Cooperation*

The Government has negotiated many bilateral and multilateral technical cooperation agreements aimed at extending the coverage of health services and improving health care for the population. Foreign cooperation has been received for development of the regionalized health services system, water supply and sanitation in rural areas, developing and strength-

ening institutions, maternal and child health, food and nutrition programs, control of leprosy and other specific diseases, prevention of blindness, research into a method for detecting Chagas' disease, the national AIDS program, and programs for immunization, diarrheal disease control, basic sanitation, and rural health.

The Government has also entered into agreements for projects with IDB, the World Bank, and the Japanese International Cooperation Agency (JICA), especially in the area of maternal and child health. These projects will run for approximately five years and will cover 12 departments, where 73% of the population resides. The total amount of project financing is US\$ 75 million: 62% from the IDB, 30% from the World Bank, and 8% from JICA.

The country also has projects with the German Development Bank; the international development agencies of Germany, Brazil, France, Japan, and the United States (USAID); UNICEF; the United Nations Population Fund; the Kellogg Foundation; the World Food Program; the United Nations Development Program; the International Development Research Center of Canada; Rotary International; and the United States Peace Corps.

USAID has provided aid for pilot projects to develop or enhance district health councils. UNICEF has provided US\$ 1.2 million in support for activities in the areas of maternal and perinatal health, child survival and development, and assistance for children living in precarious conditions. A loan from the German Credit Bank has been invested in infrastructure and equipment in the southern part of the country, and another US\$ 2.5 million is expected to be invested in the expansion of maternal and child health services in southern departments.

The Spanish Government has extended a loan for US \$32 million for specialized hospital equipment, health establishments in the capital, and health posts throughout country.