

PARAGUAY



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

Paraguay has a total land area of 406,752 km² and borders Argentina, Bolivia, and Brazil. The Paraguay River divides the country into two clearly differentiated natural regions: the western side, or Chaco, with three departments, and the eastern region which, divided into 14 departments, includes the capital (Asunción) and the main cities and population centers, roads, and networks of basic services.

GENERAL CONTEXT AND HEALTH DETERMINANTS

Social, Political, and Economic Determinants

After 35 years of dictatorship, the country has seen almost two decades of incipient democracy, but has not achieved the rule of law. Presidential and parliamentary elections were held in 2003; they were considered democratic by the international observers. In the 2002 municipal elections, 44.6% of the poorest population quintile voted, as compared to 57.9% of the wealthiest quintile. Of those who went to the polls, 39.3% of individuals from the poorest quintile went on their own initiative, as compared to 87.6% of the wealthiest (1). A high proportion of poor people are taken to the polls by political workers. According to the report by *Transparencia Paraguay* (2), the civil service is deficient in transparency, integrity, and efficiency, despite significant attempts at improvement.

Decentralization has not been effectively implemented. The principal problems observed in terms of decentralization and local government are: the lack of political agreement about the meaning and implications of decentralization, limited autonomy and capacity for decision making and management on the part of the municipalities, and lack of clarity regarding the governments' territorial authorities.

There are significant deficiencies in terms of the protection of individual rights and the administration of justice. In the country's principal prison, 79.8% of the inmates have not yet been sentenced (3). Certain factors weaken the judicial and political system, for example: complaints of police abuse, inefficiency of the security system, "legal flexibility" by means of decrees and regulations that leave laws partially effective, lack of clarity about the order of precedence of laws, and uncertainty and unpredictability of legal rulings. There are limitations on the constitutional and legal guarantee of ownership and uncertainty about property rights due to the absence of a consistent, reliable registration system (3). There is also a perception of corruption on the part of the system's operators and dysfunctions in the stability of legal norms and judicial decisions.

A deep economic recession began in 1997. At the end of 2003 the per capita GDP was 30.0% below that of 1991. In 2002 and 2003, the domestic currency lost 54.0% of its value (4), and inflation rose to 14.6% in 2002 after several years of single-digit variations; in 2003, an additional 9.3% increase (5) in the overall price level further decreased the citizens' buying power. The economic crisis, marked by stagnation of GDP growth rates, along with persistent demographic growth, set the stage for increased unemployment and underemployment, and structural poverty. Expansion of social spending is limited by the decline of productivity, tax evasion, and the regressive tax structure.

The country has a significant social deficit with respect to the Millennium Development Goals (MDGs) and discouraging prospects for meeting its goals. Poverty levels rose from 30.3% in 1995 to 33.7% in 1999 and 41.4% in 2003, and levels of extreme poverty or indigence rose from 13.9% to 15.5% and to 20.1%, respectively. In 2003, 2,346,000 people were considered poor and half of those were considered indigent (6).

The highest proportion of poverty continues to be found in the countryside: 43.4% as compared to 39.8% in urban areas. However, as a result of ongoing urban development, in 2003 some 1,269,000 poor people were located in the cities as compared to 1,077,000 in the countryside. Growing poverty brings women and children to the labor market; they add the hours of paid work to the hours of their domestic work. Women have fewer job opportunities and lower income levels, and the differences between poor women and women who are not poor become increasingly apparent. Unemployment among poor women is twice that of unemployment among women who are not poor; more than 20.0% of women who are not poor have access to higher levels of education, as compared to just 3.0% of poor women (6). Women owned just 7.4% of the lots enumerated in the 2001 Census of Communities (7).

Impoverishment of children, adolescents, and indigenous populations is noted. Half of the population under 18 years old is poor, as compared to 41.4% of the total population (8). Poverty leads to child labor, with consequent negative effects for the present and for overcoming poverty in the future (9). Unemployment

rates are higher among young people than among adults; their access to land in the rural sector is increasingly limited (6). In the indigenous population, a sign of the extreme poverty is the lack of land ownership (45% do not own land), and the majority live in huts without basic services. Just 3% of the indigenous population has access to drinking water, 1.1% to basic sanitation, and 9.7% to electricity (10).

The Paraguayan government has three initiatives for addressing poverty;¹ all three include the perspective of gender and excluded groups such as the indigenous populations, but significant progress has not been made in their implementation.

The gross preschool enrollment jumped from 27% in 1990 to 81% in 2001; the gross enrollment in the first and second cycles of basic education remained around 100%, and the gross enrollment in the third cycle increased from 27% to 53%. The gross enrollment rate for secondary education was 22% in 1990 and 44% in 2001 (11). The national illiteracy rate was 9.7% in 1992 and 7.1% in 2002, but the principal gap is found between the national figure and the figure for the indigenous population, which has an illiteracy rate of 51%. The average years of schooling for the population 15 years old and older were 7.1 in 2002, with no difference between the sexes, slightly higher than the average for 1992 (6.4 years); the indigenous peoples attend school for an average of just 2.2 years. There continues to be a marked difference in years of schooling between urban and rural areas, albeit with a decrease of the gap: from 8.1 to 8.4 years, respectively, in the censuses of 1992 and 2002 for the urban area and 4.5 and 5.3 years, respectively, for the rural area (10, 12).

Despite the implementation of educational reform with a gender perspective, there are teaching practices and formal and informal regulatory frameworks at the institutions that reinforce the traditional roles assigned to females and males. The higher educational level among women has not had positive effects on the labor market or on women's participation in politics (from 5.5% in the Chamber of Senators and 4.2% in the Chamber of Deputies in 1989 to 11% and 10%, respectively, in 2005). In social/labor spheres, just 42% of working age women are in the job market, as opposed to 75% of men, with a growing trend toward unpaid work (6).

With regard to environmental sustainability, there is continual loss and degradation of the ecosystems as a result of the competent entities' low institutional capacity, non-compliance with the law, institutional weakness of the Department of the Environment (SEAM), an agrarian policy that does not focus on sustainability, lack of planning for the rational use of water resources, little decentralization of environmental management, meager budget, and deficient management of the system of protected

areas in a context of unplanned expansion and uncontrolled extraction of natural resources. Citizens have limited knowledge about their rights, in particular about collective environmental rights.

In 2004, Law No. 2,524 "on prohibition, in the eastern region, of transformation and conversion of land areas with forest coverage" became effective. In 2005, the National Environmental Plan (PAN) of Paraguay was approved. Also, the 2004–2009 National Strategy and Action Plan for Preservation of Paraguay's Biodiversity was passed (6).

Paraguay has part of one of the world's largest aquifers and two of Latin America's biggest rivers, but geographic, cultural, and socioeconomic factors make the country vulnerable to drought, floods, tornados, and man-made disasters. Floods are due mainly to periods of rising of the Paraguay River and its tributaries, affecting the populations in poor districts or shantytowns on the river banks. In Chaco, drought is a chronic disaster.

Demographics, Mortality, and Morbidity

The annual average growth rate was 2.2% between 1992 and 2002; the total population in 2002 was 5,163,198 (12), with a significant proportion living in rural areas (43.3%), 49.6% women, and a sex ratio of 101.7 (94.4 in urban areas and 112.1 in rural areas). As Table 1 shows, the age structure shows a young population: those under 15 years old represent 37.1%, a situation that is higher in rural areas (41.3%) than in the urban areas (33.9%). The population 65 years old and older represents 4.9% of the total population.

The indigenous population totaled 89,169 in 2002 (10), representing 1.7% of the country's total population (but 31% of the population of Chaco); 90.1% lived in rural areas. Some 20 ethnic groups in five linguistic families were identified, the most numerous being the Guaraní, with six ethnic groups and a 3.7% growth rate (much higher than that of the total population). Because of the high fertility rate, the structure of the indigenous population is younger than that of the total population, with a slight predominance of males (51.7%), which is more accentuated in certain ethnic groups. Some 47.1% of the indigenous population is under 15 years old and just 2.6% is 65 years old and older.

Population density is low, with a very unequal distribution: 12.7 inhabitants/km² nationwide, 31.5 inhabitants/km² in the eastern region, and 0.5 inhabitants/km² in Chaco, a region which, despite representing 60% of the country's land area, has just 2.6% of the total population. The capital, Asunción, and the Central Department have 36.3% of the population in less than 1% of the territory (for a density of 4,377 inhabitants/km² in the capital and 552.9 inhabitants/km² in the Central Department).

Urban growth was a consequence of significant trends in migration from small urban centers outside the metropolitan Asunción area and from rural areas, with women being the principal demographic component of both the migrations and urban resi-

¹The three initiatives are the Plan for Economic Growth with Equity, the National Poverty and Inequality Reduction Strategy (ENREPD), and the National Strategy for the Fight against Poverty, Inequality, and Social Exclusion developed by the Directorate of the Strategic Plan for the Fight against Poverty.

TABLE 1. Population distribution, by age group and sex, Paraguay, 2007.

Age group	Total	%	Women	%	Men	%
Under 1	148,519	2.4	72,752	2.4	72,767	2.5
1–4	584,687	9.6	286,884	9.5	297,803	9.6
Under 5	733,206	12.0	359,836	11.9	373,570	12.1
5–9	714,131	11.7	350,716	11.6	363,415	11.8
10–14	690,550	11.3	339,363	11.2	351,187	11.4
15–19	657,891	10.8	323,976	10.7	333,915	10.8
10–19	1,348,441	22.0	663,339	21.0	685,105	22.1
20–59	2,887,303	47.2	1,425,870	47.1	1,461,434	47.2
60+	436,560	7.1	226,037	7.5	210,523	6.8
Total	6,119,642	100	3,025,598	100	3,094,044	100

Source: Paraguay, Ministerio de Salud Pública y Bienestar Social, Departamento de Bioestadísticas. Estimates according to data from the Bureau of the Census, Statistics, and Surveys (DGEEC).

TABLE 2. Demographic indicators by five-year periods, Paraguay, 1995–2015.

		1995–2000	2000–2005	2005–2010	2010–2015
Crude birth rate (per 1,000 population)	Total	29.3	26.9	24.8	22.78
	Urban	...	25.1	22.9	...
	Rural	...	29.3	27.3	...
Crude mortality rate (per 1,000 population)	Total	6	5.7	5.6	5.53
	Total	39.2	35.5	32.0	28.80
Infant mortality rate (per 1,000 live births)	Total	69.4	70.8	71.8	72.76
	Men	67.2	68.7	69.7	70.70
	Women	71.7	72.9	73.9	74.92
Life expectancy at birth (in years)	Total	69.4	70.8	71.8	72.76
	Men	67.2	68.7	69.7	70.70
	Women	71.7	72.9	73.9	74.92
Global fertility rate (children per woman)	Total	3.9	3.5	3.1	2.76
	Urban	...	2.9	2.6	...
	Rural	...	4.5	3.9	...

Source: Paraguay, Dirección General de Estadísticas, Encuestas y Censos. Data and estimates.

dence (100 women to 94 men). The 1997–2002 period saw a reduction in the intensity of internal migration in relation to 1987–1992. The foreign population as part of the total has declined: 4.6% in 1992 and 3.4% in 2002, with 47.1% from Brazil, 36.5% from Argentina, and 16.4% from other countries. The Brazilian migration is predominantly rural and the Argentine migration is predominantly urban.

The total fertility rate fell 22% in urban areas and 34% in rural areas in the 1995–1998 and 2001–2004 periods (13). In the same periods, the fertility rate of adolescents 15–19 years old fell 26%, from 90 to 67 births per 1,000 women. The most significant decline was observed in women 20–29 years old, which strongly affects the total fertility rate, because the majority of births occur in this group. The specific rate for women 20–24 years old dropped from 206 to 150 births per 1,000 women and from 204 to 142 births per 1,000 for women 25–29 years old (13). Indigenous women have an average of 6.3 children, much higher than the national average (10). Other general demographic information is found in Table 2.

The most recent mortality data available are for 2003 (14). It is estimated that, between 2001 and 2003, deaths were underre-

ported by approximately 40%. Of the deaths reported (18,400 in 2001, 18,934 in 2002, and 19,779 in 2003), 50% occurred while under medical care in 2001 and 2002 and 53% in 2003. Ill-defined causes ranged from 18.1% to 21.4% in the same years. Among the deaths while under medical care, this percentage ranged from 3.0 to 4.5. The 10 leading causes of death for the years 2001 to 2003 are shown in Table 3.

Analyzing the deaths while under medical care and with defined cause, and using the 6/67 list, Figure 1 shows the proportional distribution of the six major groups of causes for 2003 and Figure 2 shows the urban/rural differences and differences by sex.

HEALTH OF POPULATION GROUPS

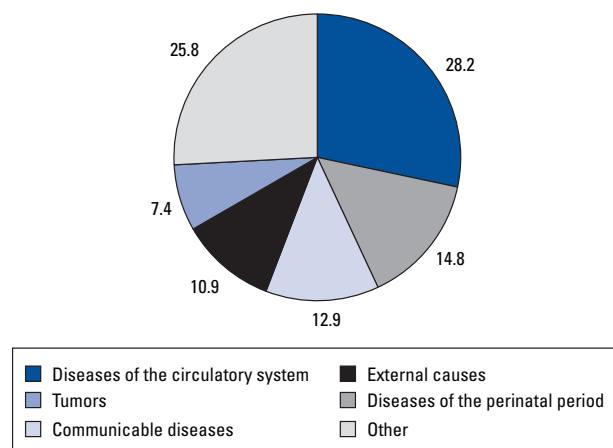
There are many limitations in Paraguay's health data. Most of the data come from the Ministry of Public Health and Social Welfare, and many of the data at other institutions in the sector are not reported or the Ministry does not have knowledge of them. Morbidity data from the services (outpatient consultation, hospitalization) are characterized by low coverage, poor quality, low

TABLE 3. Ten leading causes of death, Paraguay, cumulative 2001–2003.

TOTAL			
Total deaths	57,113		
Total deaths with defined causes	45,554		
% deaths with defined causes	79.8		
Total population	16,700,718		
Causes	Total	%	Rate per 100,000
Cerebrovascular disease	4,837	10.6	29
Ischemic heart disease	3,660	8	21.9
Diabetes mellitus	3,340	7.3	20
Certain disorders originating in the perinatal period	2,539	5.6	15.2
Influenza and pneumonia	2,186	4.8	13.1
Assaults (homicides)	2,064	4.5	12.4
Cardiac insufficiency	1,950	4.3	11.7
Land transport accidents	1,367	3	8.2
Hypertensive disease	1,058	2.3	6.3
Malignant neoplasm of the uterus	1,019	2.2	6.1
Other	21,534	47.3	128.9
Total	45,554	100	272.8
MEN			
Total deaths	31,773		
Total deaths with defined causes	25,726		
% deaths with defined causes	81.0		
Total male population	8,450,014		
Causes	Total	%	Rate per 100,000
Cerebrovascular disease	2,312	9	27.4
Ischemic heart disease	2,164	8.4	25.6
Assaults (homicides)	1,890	7.3	22.4
Certain disorders originating in the perinatal period	1,421	5.5	16.8
Diabetes mellitus	1,400	5.4	16.6
Influenza and pneumonia	1,177	4.6	13.9
Land transport accidents	1,085	4.2	12.8
Cardiac insufficiency	1,014	3.9	12
Neoplasm of the trachea, bronchial tubes, and lungs	726	2.8	8.6
Malignant neoplasm of the prostate	607	2.4	7.2
Other	11,930	46.4	141.2
Total	25,726	100	304.4
WOMEN			
Total deaths	25,335		
Total deaths with defined causes	19,823		
% deaths with defined causes	78.2		
Total female population	8,250,704		
Causes	Total	%	Rate per 100,000
Cerebrovascular disease	2,524	12.7	30.6
Diabetes mellitus	1,940	9.8	23.5
Ischemic heart disease	1,496	7.5	18.1
Certain disorders originating in the perinatal period	1,116	5.6	13.5
Malignant neoplasm of the uterus	1,019	5.1	12.4
Influenza and pneumonia	1,009	5.1	12.2
Cardiac insufficiency	936	4.7	11.3
Malignant neoplasm of the breast	569	2.9	6.9
Hypertensive disease	563	2.8	6.8
Conditions of pregnancy, birth, and puerperium	447	2.3	5.4
Other	8,204	41.4	99.4
Total	19,823	100	240.3

Sources: Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Planificación y Evaluación, Departamento de Bioestadística. Pan American Health Organization. List of Causes.

FIGURE 1. Proportional distribution of reported deaths while under medical care, with defined causes, according to the six major groups of causes, Paraguay, 2003.



Source: Paraguay, Ministerio de Salud Pública y Bienestar Social, Departamento de Bioestadísticas.

availability, and very low reliability. Moreover, the data available on the programs vary according to their service coverage and their capacity to suspect, diagnose, and report. Mortality data suffer from the difficulties mentioned above, and are particularly deficient for infant deaths, which are about 70% underreported and with respect to which the certification is of poor quality. There are also difficulties with the use of denominators, such as in the analysis of infant or maternal mortality, given the underreporting of births. Consequently, information for this age group must be viewed with caution.

Children under 5 Years Old

For 2003, a total of 151,281 births per year were estimated; of these, 86,739 live births were reported, with 43% underreporting (high even compared with 1992, when the estimate was 49.4%).

MDG 4 (reduce mortality in children under 5 years old by two thirds before 2015) is significantly behind schedule, and progress cannot be adequately measured (15). Reported infant mortality

FIGURE 2. Proportional distribution of reported deaths, by area and sex, Paraguay, 2003.

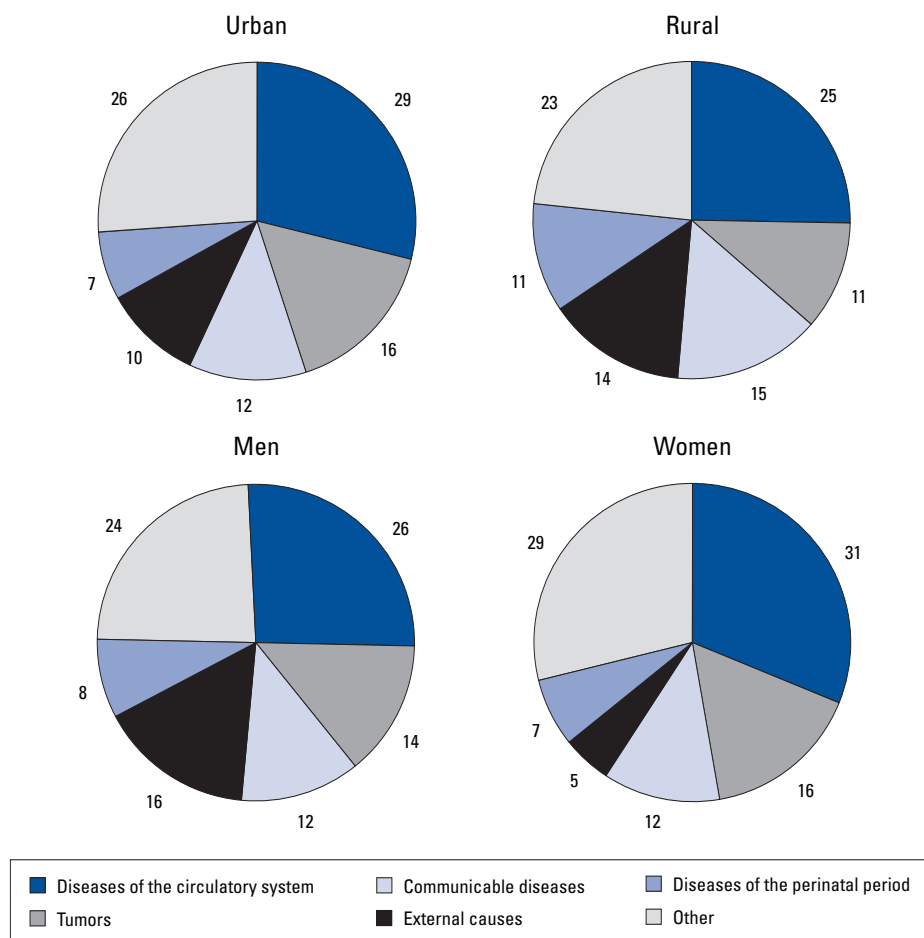
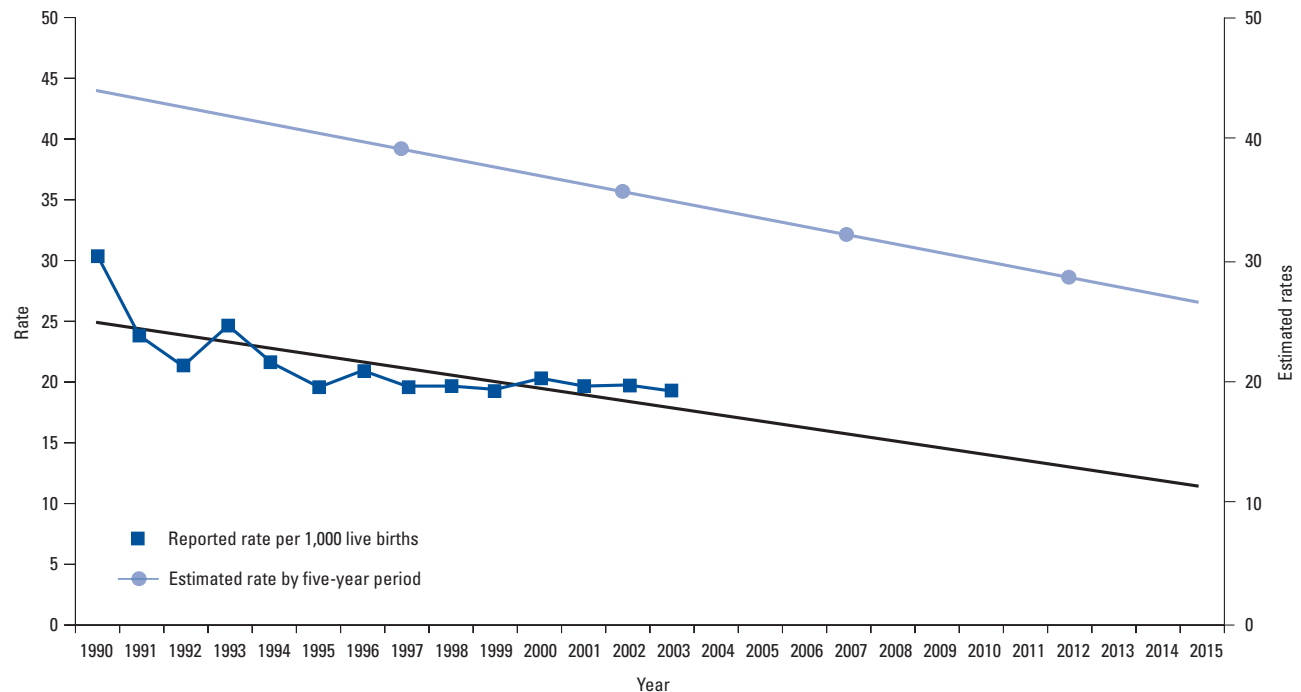


FIGURE 3. Trends in estimated infant mortality rates by five-year periods, Paraguay, 1990–2015, and reported infant mortality rates from 1990–2003.

Sources: Estimates from Paraguay, Secretaría Técnica de Planificación, Dirección General de Estadísticas, Encuestas y Censos. Reported infant deaths and certified live births from Paraguay, Ministerio de Salud Pública y Bienestar Social, Departamento de Bioestadística.

has not changed significantly since 1991, remaining around 20 per 1,000. Estimated infant mortality based on the national censuses shows a rate of decline of just 10% per five-year period, which makes achieving, or at least approaching, the goal impossible, as Figure 3 shows.

For infant deaths reported between 1999 and 2003, 60% occurred in the neonatal period and, of these, 38.5% were due to birth injuries; of the deaths that occurred in the post-neonatal period, 16.2% were due to pneumonia and influenza, and 15.8% to diarrhea.

In the population 1–4 years old, in 2003, the leading causes of morbidity were mild respiratory infections, diarrhea without dehydration, moderate respiratory infections, anemia, and parasitosis (14). Reported mortality in the population 1–4 years old dropped from 78.4 per 100,000 in 1998 to 67.4 per 100,000 in 2003. In this population, the principal causes of death while under medical care and with defined cause were communicable diseases (48%), especially pneumonia, diarrhea, septicemia, and external causes (12.4%) (14).

Children 5 to 9 Years Old

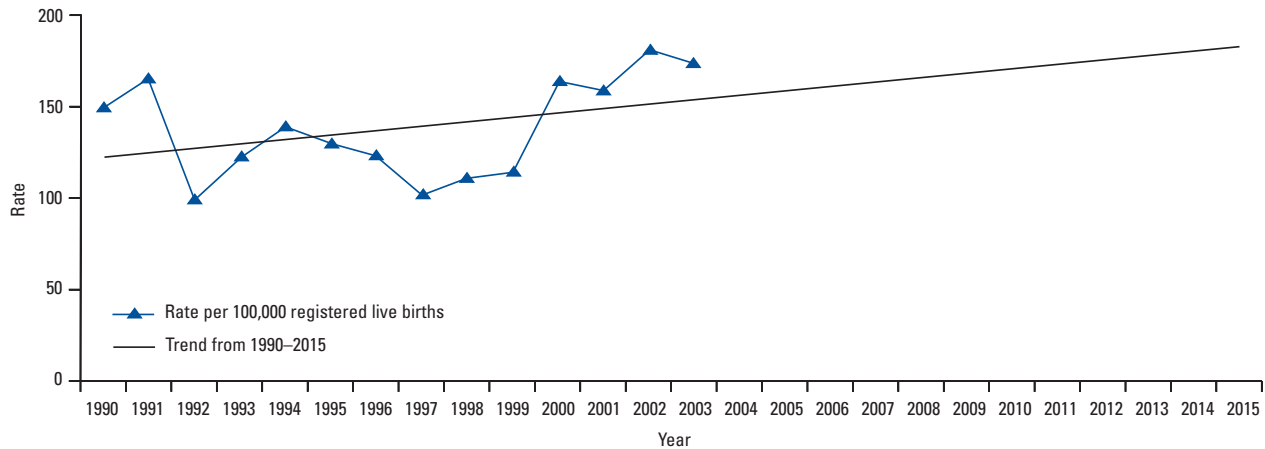
The most common causes of morbidity in this group were mild respiratory infections, parasitosis, anemia, and trauma from

external causes. The mortality rate reported in the population 5–9 years old for 2003 was 24.2 per 100,000. Some 32.7% of those reported deaths were from infectious diseases (acute respiratory infections and septicemia), and 29.1% were from external causes (accidents) (14).

Adolescents 10–14 and 15–19 Years Old

The illiterate adolescent population numbers 42,694 (4.2% are 10–14 years old and 2.6% are 15–19 years old). Adolescents from homes above the poverty line have, on average, two more years of schooling than those who come from poor homes, and 55% of the adolescent population is in school. Entry to the tertiary level is the most difficult time for remaining in the educational system: the poorest of the adolescent population barely finishes basic education, while those with more resources are assured of moving on to higher education (12).

Paraguayan women begin childbearing at a young age. Some 10.9% of adolescents 15–19 years old said they had had one or more pregnancies. Of adolescents 15–19 years old, 36% had had sexual relations. One of every three women who reported sexual experience had her first relations before the age of 16. With regard to the use of contraceptives, of all women with sexual experience, 56.3% used contraceptives the first time. Among women 15–24

FIGURE 4. Reported maternal mortality rate, Paraguay, 1990–2003, and trend to 2015.

Source: Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Planificación y Evaluación, Departamento de Bioestadística.

years old, 39.5% used contraceptives in their first marital experience and 57.6% used them in their first premarital experience (61.6% for urban women and 47% in rural areas). Of women with 12 or more years of education, 66.6% use contraceptives the first time, as compared to 38.4% of women with no education or just a fifth-grade education (13).

In a study of a population of students 12–18 years old, 66% had already consumed alcohol. The second most used drug among Paraguayan students is the cigarette; the average starting age is 14 for females and 13.8 for males. For marijuana, the average starting age is 15 (16). According to the Global Youth Tobacco Survey, 36.8% of youths 13–15 years old in Asunción smoked, 33.6% in Alto Paraná and Itapúa, 30.0% in Amambay and Caaguazú, and 26.0% in the Central Department. Prevalence is higher than in the general population and there are no significant differences between the sexes: adolescent girls smoke as much as boys (17).

The specific mortality rate by age was 32 per 100,000 for the population 10–14 years old and 74 per 100,000 for the population 15–19 years old in 2003. In the former group, 57.6% of the reported deaths occurred while under medical care and had a defined cause. Of these, 41.5% were from external causes (78% in males; 59% from accidents; 18% from suicide) and 18.6% from communicable diseases (septicemia and acute respiratory infections). For those 15–19 years old, in 50% of the deaths while under medical care and with a defined cause, 53.5% were from external causes (77.2% in males; 50% from accidents; 10.5% from suicides) and 11% from communicable diseases (14).

Adults 20–59 Years Old

The maternal mortality rate reported in Paraguay in 1999 was 114.4 per 100,000 live births, with a 23.8% reduction in relation to 1990, 20% being adolescents. Surveillance of maternal deaths was initiated in 2000 and, given the better record keeping, the

rates rose, to 174.1 per 100,000 live births in 2003 (14). Performance with regards to the MDG 5 (of reducing maternal mortality by three-fourths between 1990 and 2015) can be seen in Figure 4 and, judging by the pattern, it is impossible for Paraguay to achieve the goal by 2015.

There are significant differences in maternal mortality rates from region to region, and that is related to the quality and timeliness of care as well as the greater or lesser underreporting of deaths. The causes of maternal deaths are related to barriers in access to health services, with 46% due to a delay in arrival at the service and 23% due to the services' deficient decision making; the remaining 31% die at home without care (18). The principal biological causes of maternal death (hemorrhage, abortion, toxemia, and septicemia) continue to be avoidable. According to 2004 figures, in 94.2% of births, the mothers received prenatal care at least once and 68.6% did so during the first trimester; there are still differences among regions. The percentage of institutional births increased from 56.3% in 1998 to 74.1% in 2004. Some 10% of births are attended at home by technicians or individuals with degrees in obstetrics, and 15.8% by traditional birth attendants (13).

The mortality rate for the group 20–59 years old was 210.9 per 100,000 population between 2001 and 2003, while for defined causes it was 177.8 per 100,000. Assaults/homicides are the principal specific cause of death, followed by cerebrovascular disease and ischemic heart disease, for both sexes. For women, uterine cancer is the leading cause of death, and complications in pregnancy, childbirth, and the puerperium are the third leading specific cause of death.

Older Adults 60 Years Old and Older

A high percentage of the population of older adults is illiterate (26.4%). The incidence of poverty among people 60 years old and

older is lower than that observed for those 10–59 years old, in both urban and rural areas. Coverage of the retirement and pension systems is low (just 14% of people 60 years old and older receive social security), with significant differences between urban and rural areas (almost 20% in urban areas and 6.8% in rural areas) (19).

Some 11,273 deaths were reported in this group (2,966.8 per 100,000) in 2003. Of the 5,119 deaths that occurred while under medical care and from a defined cause, 41.5% were from diseases of the circulatory system (62% pulmonary circulatory disease and 25% ischemic heart disease), with no significant differences between the sexes, and 16.7% were from malignant neoplasms (of the trachea, bronchial tubes, and lungs, and of the prostate in men; and of the digestive system, breast, and cervix in women) (14).

Workers

Some 76.4% of the population is of working age (10 years old and older, according to Paraguay's definition) and of these, 63.4% constitute the economically active population; this percentage is slightly higher in rural areas (64.9%) than urban areas (62.4%). The population 10–14 years old has a high rate of economic participation at the national level and is included in the labor market with an activity rate of 20.8%, with male participation (28.6%) being higher than female participation (12.8%). There are high levels of participation of the population 15–29 years old, with an activity rate of 53%, and more participation by men than women. Men and women work in the tertiary sector in a proportion of 39.8% and 79.2%, respectively, while 36.6% of men and 79.2% of women work in the primary sector (20).

From 2001 to 2005, the annual average of on-the-job accidents was 1,000, with variations from 900 to 1,200. The most common injuries from these accidents are fractures of the legs or arms. The causes range from lack of protective equipment to inexperience or inattention. Of all sectors, the commercial sector generates the most on-the-job accidents, and this is due to the transport of merchandise (almost exclusively traffic accidents). The commercial sector is followed by the lumber industry, the construction industry, and the bottling industry. Bottling plants keep very good records of all their on-the-job accidents (21).

The problems related to the sexual exploitation of children are significant. There is evidence that human trafficking is a situation that affects Paraguay, but there is no up-to-date information. Children who do not have birth certificates are more vulnerable and exposed to all types of exploitation. The majority of the adolescent victims of sexual exploitation are 16–18 years old, and commercial sexual activity starts among children 12 and 13 years old, but also occurs in girls as young as 8 (22).

There is a legislative and regulatory framework for matters related to childhood. Paraguay has ratified International Labor Organization Convention 182 on the worst forms of child labor, and

ratified the state's commitment to safeguard the moral and physical health of minors and adolescents in labor matters through Law No. 1,657/2001. In 2005, Decree 4,951, which establishes the regulations for that law, was promulgated, with a list of activities considered dangerous child labor. The challenge is the full implementation of the Code on Childhood and Adolescence and of the National System for Comprehensive Protection of Childhood and Adolescence envisaged by the Code.

Ethnic Groups

In a study of 18 indigenous communities (23), seroprevalence for Chagas' disease ranged between 11% and 78%. With regard to hantavirus infection, in a sample of 957 persons from 18 communities, prevalence was 15%. In the same study, in 1,801 blood sera of indigenous people, 0.2% was positive for hepatitis B, while 7% was positive for syphilis. Of 1,720 indigenous people, 10% were obese; of 1,159 individuals, 5.4% were found to have diabetes mellitus and 7.2% were found to have altered fasting glycemia. The serious health deficiencies in these communities, especially among women and children, are associated with poverty, environmental risks, the scarcity of water, and the devastation of fauna and flora.

Displaced Persons

Displacement of communities due to lack of food and water has resulted in a drastic decrease in the number of their members, and they exhibit high prevalence of gastrointestinal and respiratory diseases and a high risk of vector-borne diseases such as Chagas' disease and hantavirus. These groups have the highest incidence rates of tuberculosis in the country.

HEALTH CONDITIONS AND PROBLEMS

COMMUNICABLE DISEASES

Vector-borne Diseases

Subsequent to the 1999–2000 **malaria** epidemic, with 16,799 cases, ongoing surveillance and control activities have achieved a 97% reduction in the number of cases per year, with 376 cases in 2005. *Plasmodium vivax* accounts for 99.8% to 99.9% (24, 25). No malaria deaths have been reported. In the rural areas of three endemic departments in the east-central zone (Alto Paraná, Caaguazú, and Canindeyú), 75% of cases are found.

Subsequent to the **dengue** epidemic in 2000, caused by dengue-1, which affected the entire country (but mainly Asunción, the Central Department, and the Brazilian border), every year saw small outbreaks or sporadic cases, with circulation of dengue-1, dengue-2, and dengue-3 in different parts of the country, especially in the metropolitan area and on the Brazilian bor-

der. Between February and May of 2006 there was an outbreak in Asunción and the Central Department, with 1,937 suspected cases and 1,213 confirmed cases (814 confirmed by laboratory test and 29 by epidemiological link). The *Aedes aegypti* mosquito is widely distributed throughout the country and the vector density is consistently high.

The first national serologic survey for prevalence of **Chagas' disease** in children 1–5 years old was carried out in 2001. Some 11,654 samples from children were analyzed and 57 were found to be infected. The samples were taken in 632 localities from 110 of the country's 227 municipalities. Of the total of seropositive children, three had seronegative mothers. The prevalence of seropositivity for *Trypanosoma cruzi* in blood banks ranged from 3.8% to 4.7% between 1996 and 2000 and from 2.8% to 4.5% between 2001 and 2005 (26). Control of transmission by transfusion achieved very high coverage.

The principal endemic zones for **American tegumentary leishmaniasis** are in the north, center, and east of the eastern region, where areas of tropical rain forests are still found. However, the first periurban outbreak of the disease was reported in early 2004 in a district of the Central Department. The transmission pattern is undergoing changes related to the loss of the original forest. Between 1999 and 2003 there was an increase in reported cases of American tegumentary leishmaniasis, from 409 to 1,133; 73% occurred in the departments of San Pedro, Alto Paraná, and Canindeyú; and 22.3% were of mucous forms.

With respect to **visceral leishmaniasis**, the number of cases has increased significantly in recent years. After just one reported case in 1995 and one in 2000, cases have been reported annually since 2002, and are increasing, reaching 23 in 2004, 16 in 2005, and 110 up to June of 2006; 90% of the cases come from the Central Department and the capital.

From 1995 to December 2005, 203 **hantavirus** infections were reported (positive IgG and IgM serology), of which 118 developed hantavirus pulmonary syndrome, with a mortality rate of 24%. Up to 2005, the cases were limited to the western region of the country which is considered endemic. But, starting in June of that year, cases were diagnosed in two departments of the country's eastern region (27).

Vaccine-preventable Diseases

Paraguay has been free from circulation of the **measles** virus since 1998. Between 2003 and 2005, the annual average of eruptive febrile diseases was 518 cases, and measles was ruled out in all of them (28). Between 1977 and 1995, the measles vaccine was given at 9 and 15 months of age and starting in 1995, at 1 year (29). In 2002 the triple virus vaccine (MMR) was introduced into the regular series and, in 2003, there was a mass vaccination of 93% of the population 1–4 years old with double viral (MR) vaccine. The average coverage increased from 78% between 1995 and 1999 to 90% between 2000 and 2005. In 2003 an outbreak of **rubella** was identified, with 11 laboratory-confirmed cases. To

eliminate rubella and congenital rubella syndrome and consolidate measles eradication, 99.7% of the population 5–39 years old (63% of the country's population) was vaccinated with MR in 2005 (30).

The last case of **poliomyelitis** was reported in 1985; the rate of acute flaccid paralysis ranged from 0.5 to 1.6 per 100,000 children under 15 years old between 1999 and 2005. The average coverage with oral polio vaccine (OPV) in the 1996–2000 period was 77%, and it increased to 87% for 2001–2005. In 2003, 93% of children under 5 years old were vaccinated with OPV.

No cases of **diphtheria** were reported between 1995 and 2000; in 2001 one case was found; and from 2002 to 2003 there was an outbreak of 50 laboratory-confirmed cases. The outbreak extended to six districts in two regions. The incidence in the general population was 0.9 per 100,000; attack rates were higher in 1–4-year-olds and 5–14-year-olds. Of the confirmed cases, 68% had no history of vaccination or had an incomplete series. The mortality rate was 15%. There were four confirmed cases in 2004 and none in 2005. The outbreaks were controlled with vaccination of individuals up to 49 years old in areas with cases and areas with low coverage, and with prophylaxis for contacted persons.

The average incidence of **neonatal tetanus** in the 1996–2000 period was 7 per 100,000 live births (12 cases), and in the 2001–2005 period, 0.4 per 100,000 live births (7 cases). Cumulative vaccination coverage in women of reproductive age with tetanus-diphtheria toxoid was 78% in the 2001–2005 period; despite that, there are still cases of neonatal tetanus, so the vaccination strategy was focused on women of reproductive age in high-risk areas.

In 2001 it was determined that 60% of the invasive diseases in children under 1 year old were due to *Haemophilus influenzae* type b (31). In 2002 the combined (Hib+DPT+Hep B) vaccine was introduced for this group and, with an average coverage of 87% from 2003–2005, it was noted that in 2005 just 3% of meningitis cases in children under 2 years old were due to Hib. In 2005, surveillance for **whooping cough** was implemented and *Bordetella pertussis* was isolated in 11 cases in children under 1 year old, not old enough for completion of the primary vaccination series (31).

With the introduction of the combined MMR and pentavalent vaccines, the cost of the program increased considerably; Law No. 2,310, which guarantees funds for the annual purchase of vaccines, was approved in 2003. That year, surveillance of adverse events from vaccines was implemented.

Intestinal Infectious Diseases

Diarrhea is the second most common reason for outpatient visits at the Ministry of Public Health and Social Welfare services, mainly in children under 5 years old (69% of reported cases). From 2001 to 2005, approximately 49,000 cases were reported on average, a slight increase in comparison with the previous period (42,000 for 1996–1999). Diarrhea with dehydration represents

approximately 10% of the total. Studies on the etiology and pattern of the enteropathogens are still insufficient. The **intestinal parasitoses** are the third most common reason for consultation, right after diarrhea. Intestinal infectious diseases are the fourth leading cause of death in children under 1 year old and the second leading cause of death in children 1–4 years old (14).

Chronic Communicable Diseases

With respect to **tuberculosis** (32), Paraguay does not have national studies of prevalence and annual risk of tubercular infection. The World Health Organization estimated, for 2004, a rate of 71 cases per 100,000 for all forms of tuberculosis (33). Detection of cases of all forms of tuberculosis has been fairly regular from 1995–2004; detection of pulmonary cases with positive bacilloscopy showed a slight increase, which may be attributed to increased detection activity in 2003 and 2004. In 2004, 2,300 new cases were reported, 54% of the estimated cases (rate of 38 per 100,000). Of these, 2,097 were pulmonary (91%); and of these, 57% had a positive bacilloscopy. Of the 203 cases of extrapulmonary tuberculosis (9% of the total), 36 (18%) were tuberculous meningitis. The Chaco region has the highest reporting rate, and the highest number of cases is reported in the metropolitan area. The mortality rate is high (4.7 per 100,000) and is associated with delayed diagnosis (33).

In 2000, the National Control Program for Tuberculosis adopted the Directly Observed Treatment, Short-course (DOTS) strategy in two demonstration areas and, for 2004, it reports that 27% of the country's population lives in DOTS areas. Analysis of the 2004 cohort of new positive bacilloscopy (BK+) cases (744 cases) in non-DOTS areas shows a 71.4% treatment success rate, 1.5% unconfirmed transfers, 14.2% abandonment, 0.1% failure, and 5.5% deaths. In DOTS areas, of 361 BK+ cases, the treatment success rate was 84.8% and the abandonment rate was 6.1%. The percentage of deaths remains high (5.8%).

The rate of primary resistance to a single drug is 6.9%; the rate of primary multidrug resistance (MDR) is 2.1% (34). The rate of secondary resistance to a single drug is 13.7%,² and the rate of secondary MDR is 4%. The high percentage of primary MDR may be related to self-administered treatment that includes rifampicin.

The goal of eliminating **leprosy** as a public health problem was achieved between 2001 and 2003, with prevalence rates of 0.92 to 0.97 per 10,000 (35). However, the rate climbed to 1.2 per 10,000 in 2004, and 14 of the 18 health regions still have a prevalence higher than 1 per 10,000. The rate of detection of new cases per 100,000 population increased from 8.0 in 2000 to 9.2 in 2003, the highest in the previous 10 years.

The coverage of polychemotherapy in 2003 was 94.4% (36). In a representative sample of 591 patients, it was found that 84%

had had the disability evaluation, 71.1% of the patients were multibacillary, and 4.5% were under 15 years old. The rate of detection of new cases with disabilities (grade 1, 2, and 3) was 25.5% in 2000 and 20.5% in 2003. The lag between the onset of symptoms and diagnosis was 60.9 months in 2003 as compared to 34.6 months in 2000 (36).

Limited access to health services and the opportunity for diagnosis result in a significant proportion of new cases with disabilities and a high hidden prevalence. The percentage of new multibacillary cases remains between 70% and 80%, which would also be a sign of delayed detection. Care for lepers is mostly outside the Ministry of Health services in specialized services included in the National Program's patient care department. Just 7.8% of the Ministry's services deliver polychemotherapy.

Acute Respiratory Infections

Acute respiratory infections continue to be the leading cause of consultations involving children under 5 years old. In the demand for Ministry of Health services for 2001, in the group of children under 5 years old, consultations for respiratory infections accounted for 63%. Of all consultations in children under 1 year old, 71% were for respiratory infections; 59% were among children 1–4 years old. Between 2001 and 2003, influenza and pneumonia was the third leading cause of death in children under 1 year old, the leading cause of death in children 1–4 years old, the second leading cause of death in children 5–9 years old, and the fifth leading cause of death in people 60 years old and older, responsible for 57,166 years of potential life lost (14).

HIV/AIDS and Other Sexually Transmitted Infections

The epidemic remains concentrated, and it was estimated in October 2004 that 16,000 to 18,000 people 15–49 years old were living with HIV. This estimate, compared to the number reported for the same age group on the same date, indicates underreporting of 80%. The prevalence of HIV/AIDS in pregnant women increased from 0.2% in 2000 to 0.8% in 2002, and in sex workers, from 0.6% in 2000 to 2.6% in 2002,³ which could be an indication of a significant expansion and possible dispersion of the epidemic. Even with this level of underreporting, the progression of the epidemic in the female population⁴ and in young people 15–24 years old is worthy of special attention; equally telling is the increasingly frequent reporting of cases outside the metropolitan area. The prevalence of HIV in blood donors ranged from 0.16% to 0.34% in the 1999–2004 period (26).

³Prevalence was obtained by seroepidemiological surveys on HIV/AIDS infection in pregnant women and sex workers, conducted by the National Program for the Control of HIV/AIDS and STIs (PRONASIDA) in 2000 and 2002. In both studies the sample size was inadequate.

⁴In 1992, for every infected woman, there were 28 infected men, and in 2004, for every infected woman there were 2.8 men infected with HIV/AIDS.

²The analysis of secondary resistance to a single drug was conducted with an insufficient sample.

The prevalence rate of condom use among women remains low: 10.5% in 2004 as compared to 1.9% in 1990. Among young women 15–24 years old, the prevalence rate of condom use in the last sexual encounter in the prior three months was 31.8% in 2004, higher than the 15.7% reported in 1996. But, in this same group, just 2.2% of the women had knowledge of all methods of HIV/AIDS prevention (13).

In 2005, the National Program for the Control of HIV/AIDS and STIs provided free antiretroviral therapy (ART) to 588 adults and 92 children (19% was based on the estimate of persons who need ART). There is no medication for prophylaxis of opportunistic diseases. Decentralization of care and distribution of ART for persons living with HIV/AIDS to the Ministry of Public Health and Social Welfare health services in border areas with Brazil and Argentina have been initiated. Prevention of the vertical transmission of HIV was initiated in 2005 with the distribution of rapid HIV diagnostic tests in the MSPyBS maternal-child hospitals in 17 of the country's 18 health regions.

The prevalence of **syphilis** in pregnant women ranged from 5.3% to 6.2% in the 2000–2004 period. The incidence of congenital syphilis for the same period increased from 1.1% to 4.9%.⁵ The prevalence of syphilis in blood donors in the 1999–2004 period ranged from 0.2% to 0.3% (26).

Zoonoses

Subsequent to the annual average of more than 300 cases of canine **rabies** in the late 1990s and the mass vaccination and change of control strategy in 1999, sporadic but persistent cases and foci were reported between 2000 and 2005. Human rabies, associated with canine rabies, remains a problem. Seven cases were reported between 2000 and 2004 (37).

About 100 cases a year of bovine rabies, more closely related to wild rabies, were reported between 1998 and 2003, while 51 cases were reported in 2004 (38). Given the constant and ongoing occurrence of cases in bovines, the veterinary service advises the annual administration of bovine rabies vaccine in areas with a high occurrence of cases.

In 1997 the country received certification as a country free of **foot-and-mouth disease** with vaccination, granted by the World Organization for Animal Health (OIE), a condition maintained and recognized during 1998 and 1999 (39). In view of the achievement of the eradication goals, vaccination was eliminated in July 1999, but in 2000 vaccination was reinstated in the border areas because of the reintroduction of the disease in the department of Canindeyú. No cases of foot-and-mouth disease were reported in 2004 and 2005. The control measures, such as mandatory vaccination, epidemiological follow-up, monitoring, and quarantine on the border, were maintained.

⁵Data is furnished by the Ministry of Public Health and Social Welfare's Department of Biostatistics based on the records of outpatient prenatal services, the coverage of which is limited and not uniformly distributed throughout the country.

NONCOMMUNICABLE DISEASES

Metabolic and Nutritional Diseases

Some 6% of newborns had low birthweight (<2,500 grams), without significant changes between 1999 and 2003 (14). The average duration of exclusive breast-feeding in children 0–5 months old is 22%, and 27.6% were mainly breast-fed (breast-milk, water, or other liquids, excluding other types of milk) (13).

Nationwide, 5% of children under 5 years old suffer from acute **undernutrition**, defined as more than two standard deviations (SDs) below the mean, and up to 6.3% in rural areas. It is estimated that 20.5% of children suffer mild undernutrition or are at risk for undernutrition (–1 SD) (rural areas, 23.6% and urban areas, 17.1%). Of children under 5 years old nationwide, 10.9% suffered from chronic undernutrition, defined as height-for-age –2 SD from the mean (14% in rural areas and 7.4% in urban areas) (40).

In 2002, 3,646 children under 5 years old were evaluated at health services of 12 health regions, and global undernutrition was found in 8.3%, chronic undernutrition in 15.9%, overweight in 14.2%, and obesity in 8%. In 2004, an anthropometric evaluation found 5.9% global undernutrition, 14.4% at risk for undernutrition, and 9.3% obesity in the same age group. In pregnant women, 32.5% were found to be underweight, 18.6% overweight, and 19.6% obese (41).

Diabetes was the third leading cause of death between 2001 and 2003, the second leading cause of death for women and the fifth for men.

Cardiovascular Diseases

In the 2001–2003 period, diseases of the circulatory system were the leading cause of death, accounting for 28% of all deaths reported with defined causes, in comparison to the 33% average for the 1996–1999 period. Among these, the male-female ratio was 1.1 and it was 3.8 to 5.6 times higher in urban areas, which is an indication, in addition to underreporting, of the poor quality and low coverage of care in rural areas. Among the specific causes of death, cerebrovascular accident was the leading cause for both sexes, 10.6% of all deaths with a defined cause and a rate of 29 per 100,000 (27.4 per 100,000 men and 30.6 per 100,000 women); ischemic heart disease was the second leading cause of death for both sexes (8% and 21.9 per 100,000) and for men (8.4% and 25.6 per 100,000), and the third leading cause of death for women (7.5% and 23.5 per 100,000) (14).

In a non-random, multicentric, predominantly urban study on the prevalence of **coronary risk** factors in 14 cities in different regions of the country (much of Chaco was excluded) (42), 8% were found to have diabetes (with regional variations between 5% and 12%), of which 33% were unaware of their status; 26% were found to have dyslipidemia, of which 57% were unaware of their status; 23% were found to be active smokers (with variations between 15.8% and 31% of residents), 15% were found to be former smokers; 21% were obese and 38% were overweight; 44% had seden-

tarism (with variations between 35.5% and 58%); and 35% had hypertension (with regional variations between 23.1% and 42.6%). **Hypertension** was found in 31.5% of women and 38.9% of men. Some 31% were aware that they were hypertensive and 85% had had their pressure taken at least once; 27% were medicated and, of these, just 37% had their pressure under control.

In a study of schoolchildren 8–18 years old in Asunción (43), 47% mentioned a family history of diabetes, 14% were overweight, and 19% were obese.

Malignant Neoplasms

Malignant neoplasms are the second leading cause of death, accounting for 14%–15% of deaths reported with a defined cause and occurring while under medical care between 2001 and 2003. Among total deaths, no significant differences were noted between men and women, but there were significant differences between urban and rural areas, with a value 5.3–6.7 times higher in urban areas, suggesting significant underreporting, very low health care coverage, and poor quality of death certification. Among deaths from tumors with a defined cause and occurring while under medical care, the leading cause of death in women was uterine cancer, followed by breast cancer and cancer of the digestive organs and peritoneum, excluding the stomach and colon. In men, the leading cause of death was cancer of the trachea, bronchial tubes, and lung, followed by cancer of the digestive organs and peritoneum, excluding stomach and colon (second leading cause), and prostate cancer (third leading cause) (14).

Considering all deaths reported and excluding those with ill-defined causes, aggregated for the 2001–2003 period, and analyzing the specific causes of death, uterine cancer is the fifth leading cause of death in women (10th overall), with a rate of 12.4 per 100,000; unfortunately, half of the cases reported do not have a site identified, but among those that do, the ratio of cervical cancer to uterine cancer was 12:5. Breast cancer is the second most common cancer in women.

OTHER HEALTH PROBLEMS OR ISSUES

Disasters

In August 2004, a massive fire destroyed Asunción's Ycuá Boñños Shopping Center, putting the lives of some 1,500 people in jeopardy. Given the magnitude of the event, a State of Emergency and a State of Health Emergency were declared. In the prehospital response, numerous rescue workers from different organizations were mobilized. Thirty-three health facilities treated 304 people injured in the fire. A total of 357 people died, and 204 children were orphaned. More than two years of psychological follow-up were provided to the families of the victims. The situation led to greater awareness among the population and heightened vigilance by government authorities, and some attempts

were made to improve conditions in public areas to prevent similar events from occurring.

In 2002, PAHO warned (44) of the increase of potential risks of chemical emergencies and disasters due to mishandling of hazardous products deposited in vulnerable places. In July 2003, a fire broke out in downtown Asunción's Cotton and Tobacco Inspection Warehouse, where tons of pesticides, fungicides, herbicides, and insecticides were stored. Firefighters were exposed to hazardous chemicals for at least four hours before safety measures were instituted. The population living near the site of the disaster had to be evacuated. At least 735 people were treated in the health services.

In 2002, the intense drought in western Paraguay, with its consequent food shortages and contaminated water, seriously damaged the national economy and the health of the population. At least 17 people died from drinking the contaminated water (45). In September 2005, an emergency was declared in Paraguay's Chaco region. The drought caused at least five deaths, attributable to the use of water unfit for human consumption. The State channeled resources to more than 20,000 indigenous people and 14,000 families in the disaster area.

Violence and Other External Causes

Between 2003 and 2005, traffic accidents represented an important cause of hospitalization and death, especially in the young population. During those years, the Medical Emergency Center in Asunción saw 21,560 people, 20% of all care for injuries from external causes. Of these, 4,225 patients needed to be admitted. Of all deaths from injuries due to external causes at that institution, in 2004 and 2005, 41% were the result of traffic accidents. In 2005, when there was a 23% increase in comparison to 2004, approximately 72% of traffic accident victims were young: 17% were 0 to 14 years old, 55% were 15 to 34 years old, and 28% were 34 years old and older (46).

According to the National Demographic and Sexual Reproductive Health Survey 2004 (13), violence against women is as follows: 33.0% verbal, 19.0% physical, and 8.0% sexual. Law No. 1,600/00 of 2000 recognizes domestic violence as a social problem and made it easier for women to file complaints. However, progress has not been made in terms of the institutional framework and the training of human resources to address the problem.

External causes accounted for 11% of deaths with a defined cause and occurring while under medical care in 2003, compared to 9.5% the previous year. The male/female ratio was 4:3, similar to previous years; the urban/rural ratio was 3:5 (14).

Considering all the deaths reported and excluding those with ill-defined causes, aggregated for the 2001–2003 period, and analyzing the specific causes of death, homicide is the sixth leading cause of death for both sexes (rate of 12.4 per 100,000) and the third leading cause of death in males (22.4 per 100,000), seventh in urban areas, and third in rural areas; land transportation acci-

dents are the eighth leading cause (8.2 per 100,000), and seventh for males (12.8 per 100,000) (14).

The National Observatory of Violence was established in 2002, joining several institutions and sectors together under the coordination of the Ministry of Public Health and Social Welfare. Violence is monitored from the perspective of the different institutions. Special emphasis has been placed on monitoring traffic violence, including measuring the impact of policies in Asunción.

Mental Health

Care is based in the Psychiatric Hospital; efforts have been made to direct care to the community, with limited success. Resources are scarce and centralized. There are 26 outpatient mental health services. Of these, 8% are exclusively for children and adolescents. These services treat 263 users per 100,000 population. Women represent 53% of all users, and 40% of all consultations involve patients 20 years old or younger. There are no data on the proportion of users who are children and adolescents.

The principal diagnoses of persons seen at outpatient services were schizophrenia and related disorders (21%) and affective disorders (20%). The information on the diagnosis is based on the number of patient consultations, not the number of users. The average number of consultations per user is 2.8. Some 15% of the outpatient services provide follow-up in the community, while 12% have mobile teams. Some of these services offer psychosocial treatment (47).

Mortality from suicide is moving in the direction of younger age groups: in 1999 the highest incidence rate was found in the 50–59-year-old group (6.6 per 100,000); in 2000 the highest rate was found in the 40–49-year-old group (4.6); and in 2001 the highest rate was found in those over 60 years old (5.6); but in 2002 and 2003 the rate was higher in the 20–29-year-old group (5.6 and 4.9, respectively) (14).

Environmental Pollution

From July 2000 to May 2004, of a total of 2,570 diagnoses of poisoning, 352 (13.7%) were caused by pesticides, with annual increases of 30% to 53%. Of those, 47.1% were caused by organophosphates, 28.7% by rodenticides and carbamates, and 10.5% by piretroides. Some 87.5% of patients poisoned by pesticides were under 45 years old; those 16–30 years old (50.3%) and those younger than 15 years old (24.1%) were affected most. The reports for 2000 to 2003 on a total of 269 patients showed that poisonings affected primary and secondary level students (22.6%), followed by domestic cases (18.2%) and farmers (11.5%) (48). Up until 2006 there was clear underreporting of cases of acute and chronic pesticide poisoning, but in 2004 surveillance of pesticide poisoning was initiated in some of the departments outside the metropolitan Asunción area, with training of health professionals, farmers, and others involved in handling pesticides. Data are still limited in coverage and quality, but the

increased capture of acute pesticide poisoning cases outside the metropolitan Asunción area, from less than 30 per year up to 2003 to 270 cases in 2004, is an important step forward. There is no information about any eco-toxicological studies that may evaluate the situation of pollution or accumulation of pesticides in the soil or in land or aquatic animals.

RESPONSE OF THE HEALTH SECTOR

Health Policies and Plans

Article 68 of the National Constitution of 1992 addresses the right to health and provides that the state shall protect and promote health as a fundamental right of individuals and in the community's interest. The 2005–2008 National Health Policy is based on: a) health reform; b) health promotion; c) social protection in health with joint financing and insurance; d) environmental health and basic sanitation; and e) development of human resources and ongoing education. With certain exceptions, the greatest difficulty for the governing entity is in complying with the policies and plans that are formulated, associated with the frequent changes in the leadership levels.

Law 1,032 of 1996 (49) established the guidelines for decentralization, but in practice, little progress has been made. There was a pilot experiment in 1998, with the participation of 23 municipalities which signed decentralization agreements, but just 10 are implementing this mode of operation. The experiments are isolated agreements and there is no comprehensive official assessment of their effect on decentralized operation. Despite the existence of legal frameworks that support social participation in health, through regional and local councils, its implementation has been scarce and controversial, since it includes the management of financial resources in its actions.

Table 4 presents an overview of the legal framework of the health system. It is evident that there are limits on rule-making and on the implementation of laws.

Health Strategies and Programs

The care delivered by the network of services is not comprehensive, is highly fragmented, lacks coordination among the various levels, and suffers from a dearth of decision making at the first level. Some 18.4% of the population has medical insurance (27% in the urban areas and 7% in the rural areas) through the Institute of Public Welfare (IPS) or another type of insurance (individual, employment, family, military, police, local, and abroad), while 81.6% have no medical insurance. Some 48.8% of those seeking services in 2003 did so at a public establishment, while in 2004 the percentage increased to 55.1%. In contrast, consultations at private hospitals or offices declined from 30.8% in 2003 to 27% in 2004; the rest of those who were ill or injured sought

TABLE 4. Legal framework of the National Health System, Paraguay.

Legal framework	Remarks
National Constitution of the Republic of Paraguay, 1992	
Law No. 836/60	Organic Law of the MSPyBS. Amended by Decree 4674/99, with regard to the organization chart.
Sanitary Code, 1980	Update has not been approved at this time.
Law No. 1,032 of 1996	Creation of the National Health System. Regulations not issued.
Decree 19,996/1998	Establishes the regulations for local health decentralization.
Decree 20,553/1998	Establishes the regulations for the Superintendency of Health.

outpatient services at pharmacies, with traditional healers, and others. Mechanisms have not been established to guarantee equal access to services and actions have not been implemented for evaluation of quality and user satisfaction.

Organization of the Health System

Law 1,032/96 establishes the regulations for the National Health System; it has both public and private components, and health services are delivered through four subsectors: public, private non-profit, private for-profit, and mixed. There is much segmentation of providers and a lack of coordination among the various subsectors, without clear separation of functions. The Ministry of Public Health and Social Welfare performs governance, delivery, and financing functions. The IPS and the private sector perform insurance, delivery, and financing functions, but the three are autonomous and there is no coordination among them.

Public Health Services

In 2005, the National Health Authority conducted a wide-ranging interinstitutional analysis aimed at establishing strategies that would make a process of primary health care renewal possible.

At the Ministry of Public Health and Social Welfare, the prevention and control of disease is principally the responsibility of the General Directorates of Health Surveillance (DGVS) and Health Programs (DGPS). The former includes the Directorate of Communicable Diseases, with responsibility for surveillance, prevention, and control programs for priority problems, the Directorate of Noncommunicable Diseases, established in 1999 and operational since 2003, the National Vector Control Service (SENEPA), with re-

sponsibility for surveillance, prevention, and control of vector-borne diseases, and the Central Laboratory for Public Health.

In 2005 a strategic plan was drawn up for the elimination of malaria as a public health problem, including diagnosis and treatment in the health services in and including the local governments in the environmental regulation process. Since 2005, the Integrated Management Strategy for the prevention and control of dengue has been included, strengthening actions in border areas, which are considered more vulnerable. The vector control program achieved, between 1999 and 2006, 100% nationwide coverage for spraying of endemic areas, with its own funds. Concurrently, in the departments in which action was taken, surveillance of the vector was initiated through sampling, with an active community (rural leaders and schools) and institutional base.

In addition to the specific actions by the National Cardiovascular Prevention Institute of the Ministry of Public Health and Social Welfare, in 2005 the country joined the CARMEN Network and set up an interinstitutional and intersectorial team for an integrated approach to the principal risk factors for chronic diseases.

The DGPS is responsible for the comprehensive child care programs, programs for the care of adolescents and women, sexual and reproductive health, mental health, and the National Institute for Food and Nutrition (INAN).

Responsibility for health information and analysis is shared by the Department of Planning and Evaluation (DGPE) and the DGVS. The DGPE includes the Department of Biostatistics, which is responsible for vital statistics in coordination with the Vital Records Office and the General Directorate of Statistics, Surveys, and Censuses, and for the records of services delivered by the Ministry's health establishments. The DGVS is responsible for the surveillance of health events. Both directorates are responsible for analyzing the data to support decision-making at the national level. However, the deficiency of infrastructure and human resources trained for analysis at all levels is recognized. The data flow from the local to the regional level and from the regional to the national level without processing or analysis; they are poor in quality and untimely; occasionally the data are collected from other institutions or sectors at each level. The surveillance data are published every four months in an epidemiological bulletin and on a weekly basis in a weekly bulletin; neither is of high quality. The pamphlet of basic health indicators was published from 1998 to 2004, but no analytic documents are produced on a regular basis and there is no systematized mechanism for health situation analysis. The Ministry of Public Health and Social Welfare does not perform regular monitoring of the MDGs. The current Health Code (dating back to 1980) establishes mandatory reporting of communicable diseases by the medical care services, be they public, private, or social security, although in practice the coverage of reporting is limited. Since the late 1990s, the Central Laboratory for Public Health has experienced strong growth at the central level in its

surveillance support function. By 2006 it had an expanded diagnostic capacity, quality control, relationships with several international reference laboratories, and participation in regional and subregional networks. For surveillance of certain problems it has networks involving private laboratories and reference hospital laboratories in and outside of the Ministry of Public Health and Social Welfare, in the capital, and in some regions. Its principal limitations are not having a national network of public health laboratories and the lack of a surveillance budget.

Three entities are considered the country's most important providers of drinking water and sewer system services, with four distinct types of operation: Sanitary Services of Paraguay (ESSAP), with specific services for population centers with more than 10,000 residents; the Sanitation Boards, supported by the National Environmental Sanitation Service (SENASA), and with services for population centers with less than 10,000 residents; and the private operators (water carriers) and community operators (neighborhood committees).

In 2000, Law 1,614/00 (50) established the bases and principles for delivery of drinking water and sanitary sewer services and created the Sanitary Services Regulatory Entity (ERSSAN) to regulate and supervise the quality and efficiency of the services, protect the community's interests, and control and verify the correct application of current provisions. Decree 18,880/2002 established the regulations for that law and empowered the Ministry of Public Works and Communications (MOPC) to develop public policies, including financing. The MOPC does not have a structure for carrying out that function, and governance of the sector is in limbo.

Despite the progress in recent years, there is low coverage of water and basic sanitation, with an enormous urban/rural gap, especially for the indigenous population. From 1992 to 2002, the percentage of the total population with access to water through a residential connection increased from 29.8% to 63.4% (84.4% of the urban population and 35.5% of the rural population) (12). The highest percentages of coverage through a residential connection are in Asunción (8), with 97.2%, and in the Central Department, with 86.4%. Of the 46.4% of households with a residential connection, 60% belong to households of the wealthiest population quintile and just 30.3% belong to the poorest 20%. The increased coverage has not been accompanied by improved water quality, and in many of the small communities and rural areas, drinking water is disinfected irregularly or not at all.

Sanitary sewer coverage is low and little progress has been made: it increased from 7.2% in 1992 to 9.4% in 2002 (12), concentrated in the urban sector (16% coverage). Asunción has the most sewer coverage in the country with 70.5%, but in 10 departments the coverage is less than 5%. Some 49.2% of all homes eliminate their excreta through a septic tank: 62.5% of all homes in the urban areas and 30.0% in the rural areas. Common latrines are used by 35.5% of all households while 2.8% use another sys-

tem and 1.1% do not have a bathroom. In urban areas, 15.2% use common latrines and in rural areas, 64.8% (8).

With respect to solid waste management, the 1992 National Constitution and various laws establish the legal, administrative, tax, and penal framework. However, this legislation contains a great deal of overlap and significant gaps in relation to the sector. There is no policy or law on solid waste with high enough legislative status for the sector (51). The SEAM is the principal authority for enforcement in all matters related to the environment, and in particular, in the area of solid waste. The Ministry of Public Health and Social Welfare is the authority when human health may be affected by the improper handling of solid waste. Solid waste management services are the only basic services that are truly decentralized; municipalities are responsible for them through direct municipal administration, privatization, outsourcing, and operation of municipal and private services concomitantly in the same city. In 2006, 66% of service delivery was in the hands of the public sector, 30% in the private sector, and in 4% there was a combination of both modalities (51).

The average rate of urban solid waste generation is about 1.0 kg/person/day, fluctuating between 0.5 and 1.8 kg/person/day, which is approximately 3,700 tons/day in the urban population centers (51). Some 33.6% of the solid waste generated in the country is collected (55.6% in the urban areas and 2.5% in the rural areas); 54.5% of the country's total population (35.9% in urban areas and 80.1% in rural areas) burns garbage (12). Final disposal of 72% of the waste is in an open-air dump, while 28% is disposed of in a controlled manner (13), mainly in the metropolitan area dump.

In relation to environmental control, it bears mentioning that agriculture and livestock generate about 27.2% of the GDP (52) and 33% of the working population carried out primary activities in 2004. More than 55% of exports are of agricultural products and a significant part of the national industry is based on the processing of just those products. The demand for chemical products for pest control has led to the use of products apparently brought in as contraband, according to accusations in the press in 2003 (53). The country has legislation through the Ministry of Public Health and Social Welfare, the Ministry of Agriculture and Livestock (MAG), the SEAM, and the Ministry of Industry and Commerce. But intersectorial coordination is weak and the institutions do not have sufficient resources to enforce the legislation. Also, there are few provisions on the matter at the municipal and departmental levels, lack of knowledge, little enforcement effort by the local and regional governments, and scant compliance with these provisions (53).

The country does not produce chemical substances, although it packages and mixes them. The distribution of pesticides in any type of packaging at the retail level and the final disposition thereof are not always in keeping with the international regulations for marketing these chemicals. The mechanisms for control of the distribution, sale, and use of pesticides are not effective enough (53).

With regard to food protection and control, the National Institute for Food and Nutrition, an institution under the Ministry of Public Health and Social Welfare, is the governing body for food and nutrition, the taking of actions for the control and prevention of iodine deficiency, and standardization of fortification with iron, folic acid, B1, B2, B3, and fluorine. It performs food and nutrition surveillance for the population in need of services (those under 5 years old and pregnant women) and promotes the implementation of nutrition guidelines. It is also responsible for control of food registration and laboratory determinations on micronutrients and foods.

The National Institute for Technology and Standardization (INTN) supports consumers, industry, commerce, and the services with assistance in research, development, standardization, certification, and metrology, in order to guarantee the quality of food. It also develops national technical guidelines for international standardization, certifies food products using product testing and analysis services, and provides technical assistance aimed at the transfer of technical knowledge.

In 2004, the National Animal Health Service was restructured to provide greater coverage, efficiency, and reliability of the services delivered (Law 2,426/04) and to address OIE quality standards, evaluation of third parties, and rapid response in the case of emerging diseases (54). Also in 2005, the system of health records of cattle owners was strengthened, and the system for traceability of the bovine species was instituted (55). The sanitary control of the slaughtering of cattle for local consumption is still weak, very often taking place in establishments that are not properly equipped and that lack ongoing veterinary inspection.

The Program for Food and Nutritional Assistance is a national program implemented in 2005 by the Ministry of Public Health and Social Welfare with the goal of delivering promotion, prevention, and food assistance and nutritional recovery services to children under 5 years old with global undernutrition and at risk, and to low-weight pregnant women, through best nutrition practices and access to nutritional supplementation.

Paraguay made progress in institutionalizing disaster preparation, prevention, and mitigation in 2005 and 2006 in relation to previous years. Law 2,615/2005 created the National Ministry of Emergency (SNE) under the Presidency of the Republic, giving higher status and priority to the issue of disaster prevention and mitigation in Paraguay; it created the National Disaster Fund, and transferred all the employees, assets, credits, and obligations of the National Emergency Committee to the SNE. In 2004, the Ministry of Public Health and Social Welfare initiated the National Program for Health in Emergencies and Disasters, under the Vice Ministry of Health.

Faced with the threat of avian influenza, in 2005 the Ministry of Agriculture and Livestock initiated epidemiological surveillance of bird flu in zoos, associated with the program for surveillance of Newcastle disease. The veterinary service's capacity to diagnose and classify viruses is still lacking. A program of edu-

cation and decentralization of the veterinary service to zone offices was initiated, along with an alliance with the Paraguayan poultry production chain to control the transit of fowl and their products, implement biosafety measures with farm personnel, and support epidemiological surveillance.

Individual Care Services

In 2004, the Ministry of Public Health and Social Welfare had 670 health posts, 50 dispensaries, 130 health centers, 23 district hospitals, 17 regional hospitals, 18 specialized hospitals, and 7 specialized centers (14, 56). Despite having a wide network, there are distribution problems. Many of these installations do not have the human resources necessary for their operation, and there are serious limitations on adequate supply. The network has grown because of political decisions and not in order to structure a network of services in keeping with the population's needs. The great functional weakness of the first level of care distorts the operation of the network of services, which focuses on hospital care.

The IPS has one general and specialized one hospital, 10 regional hospitals, five outlying clinics, and 60 first level units. It has cooperative agreements with other institutions that deliver services and train human resources in health. It covers the member and his or her descendants up to the age of 18, as well as the relatives in the ascending line, if the member is responsible for them. Police and Military Health cover less than 1% of the population. The most complicated care is delivered at the Police Clinic of Asunción, with 80 beds. The National University of Asunción has a teaching hospital attached to the School of Medicine, caring mainly for low-income sectors.

The private nonprofit subsector has 30 first level establishments. The private for-profit subsector consists of prepaid companies and insurance companies, hospitals, and clinics (153 establishments), clinics, centers, and institutes (425 establishments), physician offices (474 establishments), 342 laboratories, 15 emergency services, and 1,965 pharmacies.

The country has 49 blood bank services or hemotherapy centers, public and private (23 under the MSPyBS, 6 under the IPS, and 20 in the rest of the system). The current system for acquisition of blood is the so-called "by replacement" system. The Ministry of Public Health and Social Welfare network of ambulances consists of 196 ambulances throughout the country, of which 28 are not operating.

Health Promotion

Some of the pillars of the 2005–2008 National Health Policy are health promotion, intersectorial action, and social participation, including joint intersectorial work with community participation. Another is proposing the strengthening of the initiatives of Municipalities, Communities, Healthy Borders, and Health Promoting Schools, their operation in networks, and the creation of a National Intersectorial Committee for Health Promotion, with

Natural and Man-made Disasters: the System's Response

In August 2004, a massive fire destroyed Asunción's Ycuá Bolaños Shopping Center, putting the lives of some 1,500 people in jeopardy. Given the magnitude of the event, a State of Emergency and a State of Health Emergency were declared. In the prehospital response, numerous rescue workers from different organizations were mobilized. Thirty-three health facilities treated 304 people injured in the fire. A total of 357 people died, and 204 children were orphaned. More than two years of psychological follow-up were provided to the families of the victims. The situation led to greater awareness among the population and heightened vigilance by government authorities, and some attempts were made to improve conditions in public areas to prevent similar events from occurring. In July 2003, a fire broke out in downtown Asunción's Cotton and Tobacco Inspection Warehouse, where tons of pesticides, fungicides, herbicides, and insecticides were stored. Firefighters were exposed to hazardous chemicals for at least four hours before safety measures were instituted. The population living near the site of the disaster had to be evacuated. At least 735 people were treated in the health services. In 2002, the intense drought in western Paraguay, with its consequent food shortages and contaminated water, seriously damaged the national economy and the health of the population. At least 17 people died from drinking the contaminated water. In September 2005, an emergency was declared in Paraguay's Chaco region. The drought caused at least five deaths, attributable to the use of water unfit for human consumption. The State channeled resources to more than 20,000 indigenous people and 14,000 families in the disaster area.

Paraguay made progress in institutionalizing disaster preparedness, prevention, and mitigation in 2005–2006 in relation to earlier years. Law 2,615/2005 created the National Emergency Secretariat (SNE) under the Office of the President of the Republic, raising the profile, and hence the priority, of disaster prevention and mitigation in the country; the law also created the National Disaster Fund, transferring all the staff, goods, credits, and obligations of the National Emergency Committee to SNE. In 2004 the Ministry of Public Health and Social Welfare launched the National Emergency and Disaster Health Program under the Vice-Ministry of Health.

technical groups for management and support of specific areas. The Network of Healthy Municipalities has bylaws and an organizational structure, with a management committee named in the Assembly. However, it lacks financing and mechanisms for self-support, is little known, and still unconsolidated. The implementation of the Healthy Schools initiative can be considered a result of the healthy municipalities movement. There are 22 schools in the network in the department of Misiones and 10 more schools in Paraguay, and they have the potential to become the element that sustains the healthy initiatives in the community.

Human Resources

A human resources policy is in place, but there are still structural problems, such as the existence of personnel training models not in line with the services' requirements, insufficient staff trained in public health, and the incipient development of processes for management and regulation of professional practices. The year 2005 saw the initiation of a process of coordination of health careers for the target personnel in order to improve the position and salary structure.

The rate of Ministry of Public Health and Social Welfare doctors per 10,000 residents increased from 5.6% in 2002 (57) to 6.3% in 2005 (58), ranging from 19.6% in Asunción to 1.2% in Caazapá

(59). The rate of professional nurses in 2003 was 2.2 per 10,000 residents (57), and 2.8 in 2005 (58), ranging from 7.2% in Asunción to 1% in Caazapá (59). As for the distribution of Ministry of Public Health and Social Welfare health personnel, by occupational category, 40% are administrative, 26% auxiliary, 23% administrative professionals, and 11% technicians; 56% of the personnel are permanent and 44% are contracted. These indicators clearly show problems of inequity in access to and quality of care.

The medical residency programs do not have an adequate system for planning and quality control. Work is being done to unify the selection and admission of residents and to standardize curriculum content. There is an excess of doctors being trained, with the opening of five private universities that generate an annual cohort of more than 300 doctors, of which just 60% will be accepted in residency programs. It is estimated that approximately 40% of physicians in the health institutions are general physicians.

Health Supplies

Since 2001 there has been a National Drug Policy focusing on prescriptions. The principal developments have been: the implementation of a national system for the registration of drugs and pharmaceutical establishments; the implementation of actions for oversight of the establishments, resulting in the closing of

those that fail to comply with the standards for manufacture or dispensing; and the implementation of a program for quality control of drugs. As of 2006 (60), Paraguay had 172 authorized production laboratories, 1,529 authorized external pharmacies in the capital and 2,034 outside the metropolitan Asunción area, 13,400 records of pharmaceutical specialties, 137 distributors, and 127 importers of drugs. There are 113 authorized packagers. From 2003 to 2005, 174 products were analyzed and of these, 5% were not in compliance. In the same period, there was intervention with 23 pharmacies and 27 non-pharmaceutical businesses, and there were 31 inspections of production laboratories, packagers, and distributors.

Paraguay does not produce vaccines or human hyperimmune sera; these are obtained through the PAHO Revolving Fund for Vaccine Procurement. In 2005, the National Vaccine Regulatory Authority was established under the General Directorate of Health Surveillance. This entity registers and releases batches of immunobiologicals at the public and private level.

Since 1988, the Health Sciences Research Institute of the National University of Asunción has been producing ELISA diagnostic kits for canine visceral leishmaniasis, Chagas' disease, and toxoplasmosis; the latter two are exported to other countries.

In 2004 the Ministry of Public Health and Social Welfare took a census of the hospital equipment and furnishings in the 18 health regions and in the specialized and pediatric hospitals of the capital and the metropolitan area. There are serious deficiencies in maintenance, inasmuch as this is not included in the regular structure of operating costs. A plan for maintenance and control of the efficient use of biomedical technology has been initiated in six health regions, involving the checking of 4,464 items of hospital equipment and furnishings and the detection of equipment that is underutilized due to lack of supplies, reagents, replacement parts, or human resources.

Research and Technological Development in Health

The existing entities include the National Council for Science and Technology (CONACYT); the National Secretariat of Technology, under the National Institute for Technology and Standardization; a System of Science, Technology, and Innovation, with the legal force; CONACYT as a governing body for policies on science and technology; and a National Fund of Science and Technology (FONACYT), whose goal is to finance the related activities. In 1998, the National Accreditation Agency (ONA) was created as part of CONACYT. However, there is an absence of clarity in policies, coordination, prioritization, and regarding mechanisms for accessing funds.

Health Sector Expenditures and Financing

The General Budget of the Nation has three types of sources of income: funds from the Public Treasury (FF10—tax revenues, royalties, contributions of state-owned companies, and other rev-

enue); public credit funds (FF20—loans received by the state to finance public investment expenses); and institutional funds (FF30—generated by the institutions and administered by the receiving entity, and the donations received by the government). The status of total expenditures on health between 2002 and 2004, and their impact on the national GDP, are shown in Table 5.

Per capita public expenditures on health have averaged, for the period under analysis, US\$ 25, and private expenditures have averaged US\$ 48. Of the private expenditures, approximately 88% to 90% are expenditures by households; the rest correspond to the prepaid drug companies authorized to do business by the Superintendency of Health (61).

During the 2002–2004 period, personnel services accounted for the highest proportion of the structure of total public sector health expenditures (between 59.4% and 61.2%), followed by drugs (between 18.4% and 22.2%) and investments (between 5.6% and 7.5%). Public funding increased from 29.7% of the total in 2002 to 33.1% in 2004 (61).

Technical Cooperation and External Financing

In 2003, Paraguay received, in the areas of health and population, total non-reimbursable cooperation in the amount of US\$ 17,121,548, of which 80.7% represents multilateral cooperation (PAHO/WHO; the United Nations Population Fund, UNFPA; European Union, EU; and the United States Agency for International Development, USAID), and 19.3% represents bilateral cooperation (Canadian International Cooperation Agency, CIDA, and the Japanese International Cooperation Agency, JICA) (62); these funds represented 18.1% of the Ministry of Public Health and Social Welfare's budget. For 2004, the country received US\$ 20,390,540, of which 73.9% was contributions from multilateral cooperation (Food and Agriculture Organization of the United Nations, FAO; PAHO/WHO; UNFPA; UNICEF; EU; and USAID) and 26.1% was from bilateral cooperation (CIDA and JICA), representing 20% of the Ministry of Public Health and Social Welfare's budget for that year. In 2005, Paraguay received US\$ 15,087,795, of which 88.1% was from bilateral cooperation (Brazil, France, the United States, and Taiwan) and the rest was from multilateral cooperation (FAO and PAHO) (63), representing 15.9% of the Ministry of Public Health and Social Welfare's budget.

With regard to poverty reduction (64), Paraguay received, for 2003, a total of US\$ 34,130,488, of which 42.5% was from multilateral cooperation (EU; the Organization of American States, OAS; the Inter-American Institute for Cooperation on Agriculture, IICA); and 57.5% was from bilateral cooperation (CIDA; Spanish Agency for International Cooperation, AECI; and Taiwan). For 2004, this amount increased to US\$ 46,112,151, of which 60.5% was from multilateral cooperation (IICA, OAS, United Nations Development Program, EU, and PAHO/WHO), and 39.5% was from bilateral cooperation (CIDA, AECI, and Tai-

TABLE 5. Macroindicators of health expenditures, Paraguay, 2002–2004.

Item	2002	2003	2004
Expenditures of Central Administration (millions of Guaranis)	7,332,412	8,071,525	8,716,322
Total public expenditures (millions of Guaranis)	14,292,510	15,546,136	16,564,956
Total health expenditures (millions of Guaranis)	2,431,032	2,494,813	2,693,917
GDP (millions of Guaranis)	31,976,903	38,805,548	42,102,405
Total health expenditures/GDP (%)	7.8	6.6	6.5
Ministry of Public Health expenditures/GDP (%)	1.3	1.1	1.1
Institute of Public Welfare (IPS) expenditures/GDP (%)	1.0	1.1	1.3
Public expenditures on health/GDP (%)	2.6	2.2	2.3
Private expenditures on health/GDP (%)	5.2	4.4	4.3
Public expenditures on health/total public expenditures Ministry of Public Health expenditures/ Expenditures of Central Administration (%)	5.8	5.9	6.7
Out-of-pocket expenditures/GDP (%)	4.5	3.7	3.6

Sources: Public Sector: Presupuesto obligado. SICO. Ministerio de Hacienda. Instituto de Previsión Social.

Private Sector: Dirección General de Estadísticas, Encuestas y Censos; Ministerio de Salud Pública y Bienestar Social; Banco Central de Paraguay.

Prepared by: Comité Interinstitucional de Cuentas de Salud. March 2006.

wan). Up until 2006, residuals were used from an Inter-American Development Bank loan for Reinforcement of Primary Care, reformulated to support Strengthening of the Health System, in the amount of US\$ 21,587,201.

References

1. Paraguay, Secretaría Técnica de Planificación de la Presidencia, Dirección General de Estadísticas, Encuestas y Censos. Condiciones de vida de la población paraguaya según la encuesta de 2002. Fernando de la Mora; 2002. P. 38.
2. Transparencia Paraguay. Índice de transparencia, integridad y eficiencia: medición de la administración pública basada en elementos objetivos. Asunción; 2005.
3. United Nations Development Program. Informe nacional de desarrollo humano: Paraguay 2003. Asunción: UNDP; 2003.
4. Paraguay, Banco Central del Paraguay. Cuentas nacionales N° 40. Asunción; 2004.
5. Paraguay, Banco Central del Paraguay. Informe económico, abril 2005. Asunción; 2005.
6. United Nations. Common country assessment, Paraguay. 2005.
7. International Labor Organization. Políticas de empleo para superar la pobreza. Santiago de Chile; 2003.
8. Paraguay, Secretaría Técnica de Planificación de la Presidencia, Dirección General de Estadísticas, Encuestas y Censos. Encuesta Permanente de Hogares (EPH). Principales resultados 2003; 2004.
9. International Labor Organization, International Program to Eliminate Child Labor; United Nations Children's Fund. Seguimiento de indicadores sobre la niñez trabajadora de Paraguay. Asunción; 2003.
10. Paraguay, Secretaría Técnica de Planificación de la Presidencia, Dirección General de Estadísticas, Encuestas y Censos. II Censo Nacional Indígena de Población y Viviendas 2002. Pueblos Indígenas del Paraguay. Resultados finales. Fernando de la Mora; 2002.
11. Paraguay, Ministerio de Educación y Cultura, Dirección General de Planificación Educativa y Cultural. Análisis cuantitativo de la evolución educativa, 1990–2001. Asunción; 2004.
12. Paraguay, Secretaría Técnica de Planificación de la Presidencia, Dirección General de Estadísticas, Encuestas y Censos. Censo Nacional de Población y Viviendas 2002. Resultados finales. Fernando de la Mora; 2004.
13. Paraguay, Centro Paraguayo de Estudios de Población. Encuesta Nacional de Demografía y Salud Sexual y Reproductiva 2004. Asunción; 2005.
14. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección de Planificación y Evaluación, Departamento de Bioestadística; 2006.
15. United Nations Development Program. Objetivos de desarrollo del milenio: informe del Paraguay 2005. Asunción; 2005. Available from: <http://www.undp.org.py/rc/ODMPY2005.pdf>.
16. Paraguay, Observatorio Paraguayo de Drogas. Plan nacional antidrogas 2001–2005. Secretaría Nacional Antidrogas; 2001.
17. World Health Organization; Centers for Disease Control and Prevention. Global Youth Tobacco Survey, 2003. (No. for Paraguay: 7,916).
18. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Programas de Salud. Comisión Nacional

- Vigilancia Epidemiológica de la Salud Materna y Neonatal. Informe interno. Asunción; 2005.
19. Paraguay, Secretaría Técnica de Planificación de la Presidencia, Dirección General de Estadísticas, Encuestas y Censos. Características socio-demográficas de los adultos mayores en Paraguay. Asunción; 2005.
 20. Paraguay, Secretaría Técnica de Planificación de la Presidencia, Dirección General de Estadísticas, Encuestas y Censos. Indicadores del mercado laboral en Paraguay EPH 2004. Asunción; 2005.
 21. Paraguay, Instituto de Previsión Social. Información preliminar. [Information for the insured]. Asunción; 2006.
 22. Petit JM. Relato especial sobre la venta de niños, la prostitución infantil y la utilización de niños en la pornografía. United Nations, Commission on Human Rights and Economic and Social Council; 2004.
 23. Paraguay, Universidad Nacional de Asunción, Instituto de Investigación en Ciencias de la Salud. Situación de salud de la comunidad indígena del Chaco paraguayo, 2000. Informe técnico. Asunción; 2003.
 24. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Servicio Nacional de Erradicación del Paludismo. Informes técnicos internos. Asunción; 2006.
 25. Pan American Health Organization. Malaria in Paraguay: time series epidemiological data from 1998 to 2004. Available from: <http://www.paho.org/english/AD/DPC/CD/mal-2005.par.ppt>.
 26. Paraguay, Ministerio de Salud Pública y Bienestar Social, Centro Nacional de Transfusión Sanguínea. Unpublished. Asunción; 2006.
 27. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud. Informe técnico. Asunción; 2006.
 28. Pan American Health Organization; Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Programa Ampliado de Inmunizaciones. Sistema de Vigilancia para la Eliminación del Sarampión. Asunción; 2006.
 29. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud. Normas para el Programa Ampliado de Inmunizaciones. Asunción; 1996.
 30. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud. Sistema información campaña de vacunación para la eliminación de rubella y CRS. Asunción; 2005.
 31. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Programa Ampliado de Inmunizaciones, Laboratorio Central de Salud Pública. Informes técnicos varios. Asunción; 2006.
 32. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Programa Nacional de Control de la Tuberculosis. Informes técnicos varios. Asunción; 2006.
 33. World Health Organization. Global tuberculosis control: surveillance, planning, financing. WHO Report 2006. Geneva: WHO; 2006.
 34. Pan American Health Organization; Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Programa Nacional de Control de la Tuberculosis. Estudio sobre multidrogorresistencia. Washington, DC; 2003.
 35. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Programa Nacional Control Lepra. Documentos internos. Asunción; 2005.
 36. Pan American Health Organization; Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud. Leprosy Elimination Monitoring (LEM). Asunción; 2003.
 37. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Centro Antirrábico Nacional. Informes técnicos. Asunción; 2006.
 38. World Organization for Animal Health. Handistatus II. Situación zoonosanitaria plurianual.
 39. Pan American Health Organization, Pan American Foot-and-Mouth Disease Center. Situación de los programas de erradicación de la fiebre aftosa: América del Sur; 1999–2003.
 40. Paraguay, Secretaría Técnica de Planificación de la Presidencia, Dirección General Estadísticas, Encuestas y Censos. Encuesta Integrada de Hogares, 2000/2001. Fernando de la Mora; 2001.
 41. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Programas de Salud, Instituto Nacional de Alimentación y Nutrición. Sistema de vigilancia alimentaria y nutricional. Asunción; 2005.
 42. Sociedad Suramericana de Cardiología. Estudio de factores de riesgo coronario en Sudamérica (Argentina, Bolivia, Chile, Ecuador, Paraguay, Peru, Venezuela); 2005.
 43. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Programa Nacional de Diabetes. Factores de riesgo para diabetes tipo 2 en niños y adolescentes. Asunción; 2001.
 44. Pan American Health Organization. Health in the Americas. Washington, DC: PAHO; 2002. (Scientific publication 587; 2 vol).
 45. Paraguay, Red Cross. Información del llamamiento internacional; 2002.
 46. Paraguay, Ministerio de Salud Pública y Bienestar Social, Observatorio Nacional de Violencia y Lesiones de Causa Externa. Centro de Emergencias Médicas. Informe técnico. Asunción; 2006.

47. World Health Organization. Instrumento de evaluación para sistemas de salud mental. Preliminary report. Geneva: WHO; 2005.
48. Paraguay, Ministerio de Salud Pública y Bienestar Social, Centro Nacional de Toxicología. En: Plan de Acción Nacional de Salud Ambiental Infantil 2004–2008. OPS/OMS; 2004.
49. Paraguay. Ley N° 1.032/96 que crea el Sistema Nacional de Salud. Asunción; 1996.
50. Paraguay, Secretaría Técnica de Planificación de la Presidencia. Evaluación regional de los servicios de manejo de residuos sólidos municipales: informe de Paraguay. PAHO/WHO; 2004.
51. Paraguay. Ley N° 1.614/00: Ley General del Marco Regulatorio y Tarifario del Servicio Público de Provisión de Agua Potable y Alcantarillado Sanitario del Paraguay. Asunción; 2000.
52. FAOSTAT. Informe del servicio de estadísticas y análisis socioeconómicos; World Bank. World Development Indicators 2005.
53. Paraguay, Ministerio de Salud Pública y Bienestar Social. Plan de Acción Nacional de Salud Ambiental Infantil 2004–2008. PAHO/WHO; 2004.
54. Paraguay, Ministerio de Agricultura y Ganadería, Servicio Nacional de Calidad y Salud Animal. Informe sobre la situación del Programa de Erradicación de la Fiebre Aftosa en el país. Asunción; 2005.
55. Paraguay, Asociación Rural del Paraguay. Sistema de trazabilidad del Paraguay: reglamento. Asunción; 2005. Available from: <http://www.arp.org.py>.
56. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia de la Salud, Dirección de Control de Profesiones y Establecimientos de Salud. Documento interno. Asunción; 2005.
57. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Recursos Humanos. Documento interno. Asunción; 2002.
58. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Recursos Humanos. Base de datos. Asunción; 2005.
59. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Recursos Humanos. Censo integral de funcionarios MSPBS, 2003. Asunción; 2004.
60. Paraguay, Ministerio de Salud Pública y Bienestar Social, Dirección General de Vigilancia Sanitaria. Documento interno. Asunción; 2006.
61. Paraguay, Comité Interinstitucional de Cuentas Nacionales. Informe preliminar. Asunción; 2006.
62. Paraguay, Secretaría Técnica de Planificación de la Presidencia. Cooperación técnica internacional no reembolsable. Ejecución acumulada a diciembre 2003. Asunción; 2004.
63. Paraguay, Secretaría Técnica de Planificación de la Presidencia. Cooperación técnica internacional no reembolsable. Informe preliminar. Datos parciales. Asunción; 2006.
64. Paraguay, Secretaría Técnica de Planificación de la Presidencia. Cooperación técnica internacional no reembolsable. Ejecución acumulada a junio 2004. Asunción; 2004.