

ECUADOR



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.

Ecador is situated on the northwestern coast of South America and has a surface area of 256,370 km². The Andes mountain chain divides the country into geographic regions: coastal, mountain, Amazon, and island (the Galápagos Islands are located 1,000 km from the coast). The country is divided geopolitically into 22 provinces, which in are divided into 269 cantons; the latter are subdivided into parishes.

GENERAL CONTEXT AND HEALTH DETERMINANTS

Social, Political, and Economic Determinants

As a result of the economic crisis in 1999, Ecuador adopted the U.S. dollar as its official currency in 2000. Between 2001 and 2005, Ecuador's economy grew at an average rate of 4.9%. This performance resulted in a higher per capita gross domestic product (GDP), which expanded at an annual average rate of 3.5% during this period. The per capita GDP was US\$ 2,743 by the end of 2005. In addition, inflation decreased significantly from an annual average of 37.7% in 2001 to 2.12% in 2005, making possible the recovery of real salaries (1). Unemployment also decreased: urban unemployment went from 10.9% in 2001 to 7.9% in 2005, and, according to the National Statistics and Census Institute (INEC), unemployment among the total population (246,085 women and 215,008 men) was 9.2% in November 2003 (2). In real terms, minimum salaries increased an average of 10% between 2001 and 2005. As a result of the 1999–2000 economic crisis, approximately one million people left Ecuador in 2001–2005 in search of better living conditions and economic opportunities. By 2005, more than US\$ 1.7 billion per year entered the economy in the form of money sent from abroad.

These economic changes took place in the midst of domestic political instability, with three presidents between 2001 and 2005, even though the normal presidential term is four years. The health sector's fiscal budget—which includes the Ministry of Public Health (MSP), the Ecuadorian Social Security Institute (IESS), and other institutions—increased from 3.3% of the general budget in 2001 to 5.9% in 2005 (3). Other sources of funding included the Solidarity Fund for application of the Free Maternity and Child Health Care Law to strengthen the public network of the MSP.

In 2004, the Second Congress on Life and Health issued policies to promote interculturalism and recommendations for the structural reforms needed to implement a comprehensive (i.e., taking into account economic, psychological, social, cultural, and spiritual factors) and intercultural health care model with a gender and intergenerational approach (4). The 2005–2006 health

agenda was proposed at the same Congress to complement these policies.

The INEC carried out a national survey to measure poverty in terms of consumption.¹ It found that 41.5% lived in poverty, and 8.5% lived in extreme poverty in 2003. The next year, the figures were 52% and 14%, respectively. During 2005–2006, the rate of poverty was 79% among the rural population and 39% among the urban population. That same year, the wealthiest 20% of the population represented 46.5% of total consumption, while the poorest 20% had access to 7.7%. The Government recognized, via Executive Decree 1619 of May 2004, that poverty is one of the most serious problems facing Ecuador, so it designed a national strategy to reduce poverty through sustained institutional reform processes that would make it possible to consolidate new management parameters in the production and delivery of public social services to the most vulnerable population.

In 2004, approximately 56% of women between 20 and 49 years of age did not engage in paid labor; this percentage was slightly lower in the mountain (51%) and island (54%) areas. Women have less voice than men in political and public spheres and hold, through popular election, 31% of executive posts and 25% of local posts.

According to the 2005 *Human Development Report* of the United Nations Development Program, Ecuador ranked 82 among the 159 countries included in the measurement of the Human Development Index (HDI).

A report published in 2005 set forth the national policy for meeting the Millennium Development Goals (MDGs) (5). The report examined social progress made during 1990–2003; detailed the major challenges, including a cost analysis of the first accounting period; and highlighted the primary issue of changing trends toward inertia in economic growth and social and public action. It was estimated that a real growth of 4.5% of the annual GDP would make it possible to achieve the levels of public invest-

¹“Consumption poverty” is the number of poor people expressed as a percentage of the total population for a specific year. The “poor” are defined as those people from homes whose per capita consumption during a certain period is below the poverty line. The poverty line is the monetary equivalent of the cost of a basic basket of goods per person per time period (usually 2 weeks or a month).

ment needed to comply with the MDGs, provided that effective priorities were applied in social public spending for disadvantaged sectors.

The political instability from 2001 to 2005 caused problems in governance and social violence and increased corruption (6), administrative instability, and lack of continuity in public management (7). This situation affected the dynamics of the health sector and its potential reform. The repeated replacement of authorities (nine Ministers of Health between 2001 and 2005,) who inserted their own plans and programs in each administration—such as social protection in health, decentralization, extension of coverage, licensing of services, a comprehensive complementary and nutritional feeding program in the poorest parishes in Ecuador, and universal insurance, among others— weakened the national health authority, limiting the development and sustainability of more coherent reform processes. During the first phase of Universal Health Insurance (8), the goal was to achieve universal coverage by 2010 for the bottom two income quintiles (5,200,000 inhabitants). Also included were several initiatives for intersectoral educational and preventative actions to control epidemics (especially dengue and other communicable diseases) and comprehensive food and nutrition actions for the protection of the most vulnerable groups in the poorest urban and rural areas.

The general illiteracy rate for the population older than 15 years old was 9.0% in 2004: 9.3% in the mountains and east and 8.7% on the coast. In the provinces of Chimborazo, Cotopaxi, and Bolívar, where there is a high concentration of the indigenous population, these figures were 19%, 17.6%, and 17.5%, respectively. The rate was higher for women (10.3%) than for men (7.7%). This predominance of illiteracy among women was recorded in all provinces, except for Manabí (for example, the rate was 13.4% for men and 23.8% for women in Chimborazo). In 2005, 66.8% of the population had completed primary education (67.9% of men and 65.8% of women) (9). The proportion of women who did not enter the education system was 1% among 15- to 19-year-olds, compared with 10% among 45- to 49-year-olds. The rate of secondary and university education was 23% of women between 20 and 24 years of age, compared with 16% of those between 45 and 49 years old. Except for 15- to 19-year-olds, average schooling for women (national average = 8.7 years) decreased as age increased (10).

In its 2003 national water and sanitation policy, the Government identified the need for an investment of approximately US\$ 150 million per year to eliminate the existing deficit in water and sanitation services for 2001–2010. It is estimated that US\$ 42 million are required for this same period for the final disposal of solid wastes in 180 municipalities in the country.

In 2001–2005, two major border areas were identified for analysis and intervention by the Government as a whole and by the health sector and cooperation agencies in particular: the northern border with Colombia and the southern border with

Peru. The northern border comprises the provinces of Esmeraldas, Carchi, Imbabura, and Sucumbíos, all of which border Colombia, with the exception of Imbabura. They cover a surface area of 42,065 km² (16% of the national territory) and have 1,119,550 inhabitants (8.3% of Ecuador's population in 2005). In Esmeraldas, Imbabura, and Sucumbíos, there are 7 cantons (out of a total of 20) in which more than 90% of the population lives below the poverty line (measured by unmet basic needs), particularly in rural areas (11).

Conflict in Colombia led to the displacement of people from that country in search of refuge. The MSP and the United Nations High Commissioner for Refugees (UNHCR) registered an increase in refugee applications. There were 475 applicants in 2000, 11,515 in 2003, and 27,190 in the first half of 2004. As of the first quarter of 2006, 12,000 people had received refugee status, and they are primarily located in the provinces of Sucumbíos, Esmeraldas, Imbabura, Pichincha, Carchi, and Azuay.

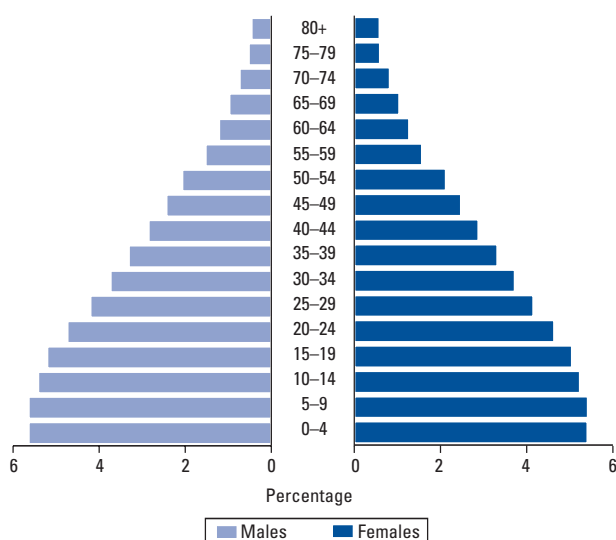
Ecuador is at risk for natural disasters due to multiple threats (geographic faults, volcanoes, steep terrain, deforestation, floods, landslides, etc.), which interact with the vulnerabilities of a high percentage of the population. The Andes mountain range and highly volcanic islands have a group of 72 volcanoes with some risk factor; at least 13 of them represent a significant risk to the population. The most well known are Tungurahua, Guagua Pichincha, Reventador, Cotopaxi, Sangay, and Sierra Negra (in the Galápagos).

Demographics, Mortality, and Morbidity

In 2005, the total estimated population was 13,215,089, of which 6,586,721 (49.8%) were women (Figure 1). Population density is 49.3 inhabitants per km², and the majority of the population (63.4%) lives in urban areas. The population distribution is not homogenous and is concentrated in the most developed areas of the main provinces (Guayas 26% and Pichincha 15%), especially in the cities of Quito (12%) and Guayaquil (17%) (12). Ecuador is multicultural and multiethnic; according to the Sixth Population Census carried out by the INEC in 2001, 6.1% of the population over 15 years of age is considered to be indigenous, 5% Afro-Ecuadorian and mulatto, 77.7% mestizo, and 10.8% white. The indigenous population was concentrated in certain provinces; in 2005, it was as follows: Chimborazo 70%, Cotopaxi 60%, Imbabura 45%, Bolívar 40%, and Tungurahua 28% (13).

As per the 2001 population census, the annual population growth rate was 2.05% compared with 2.19% in 1990, with greater growth in the urban sector (3%) than in the rural sector (0.85%). According to various sources, the total fertility rate continued to decrease during 2001–2005. In 2001, it was 2.8 children per woman, and it was 2.7 in 2005 (14, 15). According to the INEC and the Latin American and Caribbean Demographic Center (INEC-CELADE), the total fertility rate was 2.8 children per woman during 2000–2005 and 3.1 during the previous period

FIGURE 1. Population structure, by age and sex, Ecuador, 2005.



Source: Ecuador, Population Projections 1950–2025, INEC-CEPAL.

(1995–1999) (16), while the 2004 Demographic and Maternal and Child Health Survey showed that the total fertility rate was 3.3 for 1999–2004, with the highest rates in rural areas, 3.9 (urban 2.9); among the indigenous population, 4.9; and among mestizos, 3.1.

According to INEC-CELADE, the aging index for 2005 was 25% (adults over 60 years of age/0- to 14-year-old population). Life expectancy in the periods of 1995–1999 and 2000–2005 increased for both sexes from 72.3 to 74.2; for men the increase was from 69.6 to 71.3 and for women it was from 75.1 to 77.2 (16). There were 305,620 live births registered in 2004, of which 53.3% corresponded to births in that same year; the rest were late registrations (46.7%).

The estimated underreporting of mortality for 2000–2005 was 13.4%. The crude mortality rate (per 1,000 population) was estimated at 5.8 for 2001 (14) and at 5.0 for 2005 (15). The INEC reported in 2003 that death certificates were issued for 76.9% of deaths and that the causes for 12.6% of those deaths were ill-defined (17). Previously (in approximately 2000), the latter figure was 13.3% (18). In 2004, a total of 54,729 deaths were registered (31,292 men and 23,437 women); the main causes of death are detailed in Table 1.

In 2004, the causes of death were distributed differently among men and women. The rate for cirrhosis and other liver diseases was 8.0 per 100,000 population for women and 17.0 for men; for diabetes mellitus it was 23.0 for women and 18.0 for men; and for cardiac insufficiency, complications, and ill-defined diseases of the heart, the rate was the same for men and women, 31.0.

In 2004, the causes of violent death per 100,000 population were aggression (homicides), 18.0 (32.0 men, 3.0 women); traffic accidents, 14.0 (22.0 men, 7.0 women), and suicides, 6.0 (9.0 men, 4.0 women).

HEALTH OF POPULATION GROUPS

Children under 5 Years Old

In 2001, the estimated infant mortality rate per 1,000 live births was 24.9, and in 2004, it was 22.3 (15). In 2003, a total of 3,942 children died before their first birthday (2,241 boys and 1,701 girls), of which 3,121 were reported in urban areas, and 821 in rural areas. Most of the deaths occurred in the mountain region (2,100), and Pichincha was the province with the most deaths (1,061). The leading causes of infant mortality were complications related to the duration of gestation and fetal growth (14.8%, 340 boys and 244 girls), pneumonia and influenza (10.1%, 218 boys and 181 girls), bacterial sepsis in newborns (9.0%, 205 boys and 150 girls), other respiratory illnesses in newborns (6.1%, 143 boys and 99 girls), and respiratory difficulty in newborns (4.5%, 97 boys and 80 girls) (19). With regard to breast-feeding, 73% of women interviewed in 2004 breast-fed the first day after birth; at 3 months only 49% were breast-feeding exclusively. A total of 39.6% of infants under 6 months were breast-fed exclusively. The total average (not exclusive) was 16 months (10).

In 2003, there were 1,800 registered deaths of children between 1 and 4 years old (996 boys and 804 girls). The main causes of death were influenza and pneumonia (14.4%), followed by infectious intestinal diseases (11.2%), accidental drowning and submersion (5.4%), malnutrition and nutritional anemia (4.7%), and traffic accidents (3.4%) (20). In 2004, the MSP reported coverage of 20.6% in ambulatory care for this age group (21).

Children 5–9 Years Old

In 2005, this group constituted 21.1% of the population (with a similar proportion for males and females). In 2003, there were 1,364 registered deaths among those between 5 and 14 years old (787 boys and 577 girls). Traffic accidents were the leading cause of death (12.1%), followed by accidental drowning and submersion (6.0%); influenza and pneumonia (5.8%); malignant neoplasms in lymphatic, hematopoietic, and related tissues (4.8%); and urinary tract diseases (2.8%). Malnutrition and nutritional anemia were ranked tenth at 1.7% (20). A study carried out in 2001 found a 14% prevalence rate of overweight and obesity in 8-year-old schoolchildren (obesity 5% and overweight 9%) (22).

Adolescents 10–14 and 15–19 Years Old

According to INEC projections, in 2005 children and adolescents between 10 and 19 years old represented 20.7% of the total

TABLE 1. Mortality rate, by cause and sex, according to the condensed list of 103 groups of causes, ICD-10, Ecuador, 2004.

Code	ICD-10 codes	Causes of death	Country total								
			Total			Males			Females		
			Number	Rate	%	Number	Rate	%	Number	Rate	%
		2004 estimated population	13,026,891			6,535,564			6,491,327		
		Total deaths	54,729			31,292			23,437		
		General mortality rate	420.1			478.8			361.1		
068	I26–I51	Other heart diseases	4,014	30.8	7.3	2,010	30.8	6.4	2,004	30.7	8.6
074	J12–J18	Pneumonia	2,998	23.0	5.5	1,608	24.6	5.1	1,390	21.3	5.9
069	I60–I69	Cerebrovascular diseases	2,949	22.6	5.4	1,540	23.6	4.9	1,409	21.6	6.0
052	E10–E14	Diabetes mellitus	2,672	20.5	4.9	1,179	18.0	3.8	1,493	22.8	6.4
066	I10–I13	Hypertensive diseases	2,474	19.0	4.5	1,289	19.7	4.1	1,185	18.1	5.1
102	X85–Y09	Violence	2,315	17.8	4.2	2,104	32.2	6.7	211	3.2	0.9
067	I20–I25	Ischemic heart diseases	2,300	17.7	4.2	1,379	21.1	4.4	921	14.1	3.9
092	P00–P96	Certain conditions originating in the perinatal period	1,906	14.6	3.5	1,109	17.0	3.5	797	12.2	3.4
096	V01–V99	Transport accidents	1,873	14.4	3.4	1,451	22.2	4.6	422	6.5	1.8
080	K70–K76	Liver diseases	1,655	12.7	3.0	1,124	17.2	3.6	531	8.1	2.3
029	C16	Malignant neoplasm of stomach	1,484	11.4	2.7	822	12.6	2.6	662	10.1	2.8
076	J40–J47	Chronic diseases of the lower respiratory tract	909	7.0	1.7	529	8.1	1.7	380	5.8	1.6
101	X60–X84	Intentional self-inflicted harm	796	6.1	1.5	559	8.6	1.8	237	3.6	1.0
012	A40–A41	Septicemia	697	5.4	1.3	356	5.4	1.1	341	5.2	1.5
005	A15–A16	Respiratory tuberculosis	697	5.4	1.3	471	7.2	1.5	226	3.5	1.0
053	E40–E46	Malnutrition	646	5.0	1.2	315	4.8	1.0	331	5.1	1.4
040	C61	Malignant neoplasm of prostate	636	4.9	1.2	636	9.7	2.0	0	0.0	–
031	C22	Malignant neoplasm of liver and intrahepatic bile ducts	573	4.4	1.0	279	4.3	0.9	294	4.5	1.3
034	C33–C34	Malignant neoplasm of trachea, bronchi, and lungs	569	4.4	1.0	332	5.1	1.1	237	3.6	1.0
093	Q00–Q99	Congenital malformations, deformations, and chromosomal abnormalities	503	3.9	0.9	265	4.1	0.8	238	3.6	1.0
020	B20–B24	Human immunodeficiency virus (HIV)	495	3.8	0.8	404	6.2	1.1	91	1.4	0.3
098	W65–W74	Accidental drowning and submersion	467	3.6	0.9	391	6.0	1.2	76	1.2	0.3
045	C91–C95	Leukemia	458	3.5	0.7	237	3.6	0.7	221	3.4	0.8
049	D50–D64	Anemia	424	3.3	0.8	198	3.0	0.6	226	3.5	1.0
038	C54–C55	Malignant neoplasm of corpus uteri or uterus, part unspecified	409	3.1	0.7	0	0.0	–	409	6.3	1.7
030	C18–C21	Malignant neoplasm of colon, rectum, and anus	401	3.1	0.7	175	2.7	0.6	226	3.5	1.0
097	W00–W19	Falls	369	2.8	0.7	303	4.6	1.0	66	1.0	0.3
003	A09	Intestinal infectious diseases	334	2.6	0.6	178	2.7	0.6	156	2.4	0.7
036	C50	Malignant neoplasm of breast	312	2.4	0.6	8	0.1	0.0	304	4.7	1.3
032	C25	Malignant neoplasm of pancreas	256	2.0	0.5	122	1.9	0.4	134	2.1	0.6
056	F10–F19	Mental and behavioral disorders due to psychoactive substance use	251	1.9	0.5	228	3.5	0.7	23	0.4	0.1
079	K25–K27	Gastric and duodenal ulcers	247	1.9	0.5	156	2.4	0.5	91	1.4	0.4
043	C82–C85	Non-Hodgkin's lymphoma	239	1.8	0.4	136	2.1	0.4	103	1.6	0.4
037	C53	Malignant neoplasm of cervix uteri	235	1.8	0.4	0	0.0	–	235	3.6	1.0
042	C70–C72	Malignant neoplasm of meninges, brain, and other parts of the central nervous system	204	1.6	0.4	111	1.7	0.4	93	1.4	0.4
070	I70	Atherosclerosis	163	1.3	0.3	81	1.2	0.3	82	1.3	0.3
100	X40–X49	Accidental poisoning or exposure to harmful substances	156	1.2	0.3	125	1.9	0.4	31	0.5	0.1

(continued)

TABLE 1. Continued.

Code	CIE-10 codes	Causes of death	Number	Rate	%	Number	Rate	%	Number	Rate	%
083	M00–M99	Diseases of the musculoskeletal system and connective tissue	154	1.2	0.3	52	0.8	0.0	102	1.6	0.4
059	G00,G03	Meningitis	126	1.0	0.2	78	1.2	2.0	48	0.7	0.2
039	C56	Malignant neoplasm of ovary	111	0.9	0.2	0	0.0	–	111	1.7	0.5
089	010–092	Other obstetrical deaths	109	0.8	0.2	0	0.0	–	109	1.7	0.5
099	X00–X09	Exposure to smoke, fire, and flames	101	0.8	0.2	66	1.0	0.2	35	0.5	0.1
094	R00–R99	Symptoms, signs, and abnormal clinical and laboratory findings not classified elsewhere	6,363	48.8	11.6	3,338	51.1	10.7	3,025	46.3	12.9
		Other causes of death	9,679	74.3	17.7	5,548	84.9	17.7	4,131	63.2	17.6

Note: The information in the table includes the population in unmapped areas and includes 69 deaths of residents abroad; the rate is per 10,000 population.

population (more than 2.7 million), of which 46.9% were male, and 53.1% were female (23). In 2004, a study (24) found that 45% of adolescent deaths between 12 and 17 years of age were preventable, such as accidents or acts of violence. According to that same study, between 2000 and 2002 an average of 1,200 adolescents died per year from the same causes. It was also estimated that there were a total of 256 suicides (one every 4 days). In 2003, 32% of adolescents between 15 and 19 years old reported experiencing some form of violence (25).

In 2004, 27.0% of females between 15 and 19 years of age had had sexual relations, and 38.9% of those between 15 and 24 years of age had been pregnant—38.0% in urban areas and 40.3% in rural areas. Percentages by region were 43.0% on the coast, 42.9% in Amazonia, and 35% in the mountains. By province, Los Ríos had the highest percentage (50.8%) (10). The INEC reported in that same year that 78.6% of births were attended by a professional (19). In 2003, the INEC reported 30,489 abortions; this was the second leading cause for hospitalization of women at the national level (16). In 2004, the MSP reported 20,439 abortions and 21,358 dilation and curettage procedures (21).

Adults 20–59 Years Old

In 2005, the average age of the population was estimated at 24 years. The population between 15 and 29 years represented 27.7% of the total population, and adults between 30 and 59 years, 32%. In 2004, 13.5% of females between 15 and 24 years old who had had a sexual experience reported having used a contraceptive method in their first sexual relation. The national average of contraceptive use was 73%, and it was 47% among indigenous people. Condoms were the most frequently used method (6.7%). With regard to births, among females between 15 and 49 years old, 43.9% received care in MSP institutions, 20.1% in homes with or without midwives, 19.2% in semiautonomous institutions, and 16.8% in private institutions (10). That year, the MSP reported providing care in 130,524 births (estimated cover-

age of 36%). The provinces with the greatest number of attended births were Pichincha (31,091, 47.3% coverage), Guayas (19,666, 21.2% coverage), and Manabí (13,437, 34.3% coverage). Also in 2005, a total of 30,783 Cesarean sections were reported with the highest numbers by province in Pichincha (7,098), Guayas (4,484), and Manabí (3,918). The Ministry of Public Health registered 144,514 cervical-uterine cytologies in 2004 (estimated coverage of 8.3%) (21).

In 2001, the estimated maternal mortality ratio was 97 per 100,000 live births and in 2003, it was 77.8 (15, 26). In 2004, the INEC reported that the main causes of maternal death were: eclampsia and other hypertensive disorders (41.7%), complications during labor and birth (31.7%), pregnancy ending in abortion (6.5%), and complications primarily related to the puerperium (5.8%). In 2004, the national maternal mortality rate was 76.4 per 100,000 live births. In terms of rural and urban distribution, the Maternal Mortality Epidemiological Surveillance System stated there were more deaths among rural women living in high-poverty areas (65%), which coincides with the information provided by the Demographic and Maternal and Child Health Survey in 2004. In 2003, the INEC registered 12,089 deaths of people between 15 and 49 years of age (8,213 men and 3,876 women). The leading causes were homicides (12%, 1,346 men and 114 women), traffic accidents (9.7%, 988 men and 194 women), suicides (4.4%, 344 men and 186 women), accidental drowning and submersion (4.1%, 420 men and 78 women), and cerebrovascular diseases (3.4%, 247 men and 167 women). During that same year, 8,053 deaths were reported among people 50 to 59 years of age (4,821 men and 3,232 women). The leading causes of death were diabetes mellitus (8.3%, 345 men and 322 women), cerebrovascular diseases (6.0%, 277 men and 207 women), cirrhosis and other liver diseases (5.8%, 345 men and 121 women), ischemic heart diseases (5.4%, 296 men and 144 women), and hypertensive diseases (4.8%, 234 men and 155 women). In this age group, 193 deaths from malignant neoplasm of the uterus were reported (2.4% of the total) and 122 from fe-

male breast cancer (1.5% of the total). Traffic accidents (3.8%) fell to eighth place among this group, and malignant neoplasm of the stomach (3.6%) was ninth (27).

Older Adults 60 Years Old and Older

Based on the 2001 population census, the 2004 population projection for the 65-year-old and older age group was 724,658 (53.2% women), and for 2000–2005, it was estimated that there would be a 16.5% increase among this group (19). In 2003, 26,173 deaths were reported (13,317 men and 12,856 women). The leading causes of death were cardiac insufficiency, complications of heart disease, and ill-defined heart diseases (8.7%, 1,045 men and 1,220 women); cerebrovascular diseases (7.5%, 956 men and 1,011 women); hypertensive diseases (5.9%, 712 men and 823 women); ischemic heart diseases (5.8%, 859 men and 647 women); and diabetes mellitus (5.8%, 600 men and 905 women) (27). In 2005, the IESS reported 87,000 retired people who were members, of which 17,000 received social services to complement health services.

The Family

In terms of family composition, in 2003–2004, family groups had an average of 4.1 members in urban areas, with a difference between the poorest (5.4) and wealthiest quintiles (3.0). During the same period, per capita income per family group was US\$ 177.70 per month—US\$ 48.90 for the poorest quintile and US\$ 555.60 for the wealthiest (28). Emigration had a significant impact on the structure of homes; in 2003, it was reported that an average of 15% of families in the main cities of Ecuador (Quito, Guayaquil, and Cuenca) had a family member who had emigrated. Emigrants were distributed equally by sex in the national total (50% for each), with the exception of Cuenca, where men predominated at 67%. The greatest concentration was among the 20- to 39-year-old age group (29).

Ethnic Groups

The average rate of chronic malnutrition in indigenous children from 0 to 59 months was 47%, while the national average for that age group was 23%. The global malnutrition rate among children under 5 was 9.4%; it was 15.3% among indigenous children, 11.6% among children of African descent, 8.7% among mestizos, and 6.3% among whites.

In 2004, the average percentage of women who are members of or who received benefits from public social security was 15.7%, and 13.7% of indigenous women. The percentage of indigenous women who reported being physically mistreated before their 15th birthday was 40.8% (national average 27.7%), and 34.7% reported being psychologically mistreated (national average, 24.9%) (30).

Displaced Persons

In 2004, a ministerial agreement ratified Ecuador's commitment to humanitarian assistance and care for the refugee population. Refugees were incorporated into the regular programs of the MSP, and it was established that they should receive health care under conditions equal to those of the local population. Care for pregnant refugee women was also integrated into the Free Maternity and Child Health Care Law. In that year, coverage for prenatal care for this group in provinces with refugees was 87.8% in Carchi, 79.2% in Imbabura, and 82.8% in Esmeraldas (national average of 80.6%). In terms of professional assistance at birth, Carchi reported 78.5%, Imbabura 60.4%, and Esmeraldas 51.8% (national average of 75.0%) (10). With regard to ambulatory care in MSP facilities in these provinces, the most common diseases were 15,058 cases of acute respiratory infections in Carchi (65.2%), 2,328 cases of acute diarrheal disease in Esmeraldas (65.9%), and 15,644 cases of acute respiratory infections in Sucumbíos (60.8%) (31).

HEALTH CONDITIONS AND PROBLEMS

COMMUNICABLE DISEASES

Vector-borne Diseases

With regard to **malaria**, in 2001, the annual parasite index (API) per 1,000 population was 22.5, and the provinces with the highest API, in order of frequency, were: Cotopaxi (54.7), Esmeraldas (54.7), Sucumbíos (53.5), and Pichincha (35.1). In 2005, the national API was 2.21, and the highest APIs were recorded in Esmeraldas (17.0), Pastaza (6.6), Pichincha (5.9), and Sucumbíos (5.0). That year, Esmeraldas was the province with the highest percentage of malaria cases with 29.0%. During 2001–2005, most malaria cases were transmitted by *Plasmodium vivax*, even though there were some cases transmitted by *P. falciparum*. In 2005, a total of 358,361 blood samples were examined from which 16,487 cases were diagnosed, of these 2,127 were positive for *P. falciparum*, and 14,360 were positive for *P. vivax*. The most affected age group was the economically active population (15 to 44 years), with 65% of the total cases. Therapeutic failure in 90% of patients after antimalarial treatment exceeded the recommended threshold of 25%. Incipient resistance to sulfadoxine with pyrimethamine was detected at levels of 8%. Susceptibility of *P. vivax* to the use of chloroquine remained at 100% (32).

With regard to the transmission of **dengue**, *Aedes aegypti* were found in tropical, Amazon, subtropical, and island areas of the country, and four serotypes of the dengue virus were identified. In 2003, there was a dengue outbreak with a total of 10,726 suspected cases of classic dengue and 206 confirmed cases of **hemorrhagic dengue**, of which 189 were in the province of Guayas, for a provincial rate of 5.44 per 100,000 population. The rate of incidence in the coastal region was 3.15 (33). In 2004, 6,057 cases

were reported in Ecuador, of which only 1,111 were confirmed through examination. In 2005, there were 4,653 confirmed cases; the highest rates were seen in Napo, Zamora, and Manabí, with 268.0, 135.1, and 131.0 per 100,000 population, respectively. In 2004, there were 64 reported cases of hemorrhagic dengue in the entire country, primarily concentrated in the coastal provinces: 46 cases in Guayas, 10 in Manabí, 3 in Los Ríos, and 2 in El Oro (the rate for the coastal region was 0.9 per 100,000 population). In 2005, there was an outbreak of hemorrhagic dengue in the coastal region with 334 cases (rate of 4.9 per 100,000 population and a case fatality rate of 4.2%). The highest numbers of these cases were located in Guayas (225; 175 of them in Guayaquil), Manabí (75), and Los Ríos (14).

No cases of **yellow fever** were reported in 2001. Sentinel sites in place since 2003 made it possible to improve surveillance of the acute hemorrhagic febrile icteric syndrome related to yellow fever. Rapid monitoring was implemented for urban and rural coverage in Amazonia to improve coverage among the high-risk population (34).

During 2000–2004, there were 32 cases of **plague** and 3 deaths were reported. No cases were reported in 2005; however, risk factors continued to be observed (35).

Areas at risk for **Chagas' disease** included 183 cantons in 20 provinces. Of the approximately 8.4 million people living in these areas, 3 to 5 million were especially vulnerable because of their living conditions or poverty. The general prevalence of infection by *Trypanosoma cruzi* reached 1.3% of the general population (0.6% in the mountains; 1.9% on the coast, and 1.7% in Amazonia).

Ecuador was part of the regional initiative headed by the **Onchocerciasis** Elimination Program for the Americas. Within the framework of the regional strategy, effective, safe, and locally sustainable programs were also carried out to distribute ivermectin in endemic localities. In 2001, WHO distributed elimination criteria, and Ecuador initiated a certification process based on them. In 2002, two rounds of distribution and treatment were carried out, with a coverage rate of 94.8% in the eligible population. In 2005, the distribution of ivermectin as a strategy to eliminate the disease was carried out in 119 communities where **onchocerciasis** is endemic: 117 in the province of Esmeraldas and 2 in Pichincha (approximately 25,000 people at risk).

Vaccine-preventable Diseases

In 2006, the Expanded Program on Immunization (EPI) marked 16 years without **poliomyelitis**, 9 without **measles**, 4 without **yellow fever**, and 1 without **rubella** and managed to eliminate **neonatal tetanus** as a public health problem. The vaccine law, created in 1999 and amended in 2000, helped in obtaining these results and also made it possible to have budgetary allocations to finance the application of regular vaccines and to introduce new vaccines. Starting in 1999, a vaccine against yellow fever was introduced among the population under 1 year of

age in the Amazon region. In 2000, a triple MMR (measles, **mumps**, and rubella) viral vaccine was introduced, and in 2003 a pentavalent vaccine was introduced (**diphtheria**, **tetanus**, **whooping cough**, **hepatitis B**, and *Haemophilus influenzae type b*) with three doses in children under 1 year. A monovalent vaccine against hepatitis B was also incorporated for school children in risk areas. Coverage levels remained above 90% in 2004–2005 (in that last year, for example, the three doses of the pentavalent reached 93.45%; the three doses of the poliomyelitis oral vaccine was 92.6%, and the MMR was 92.9%). The country increased its notification rate of flaccid paralysis from 0.5 per 100,000 children under 15 in 2004 to 1.0 in 2006 (as of epidemiological week 25).

Comprehensive surveillance of **measles** and **rubella** was strengthened, which increased notification of suspected cases. With regard to the elimination of rubella, Ecuador began applying vaccination strategies for MR (measles and rubella), suggested by PAHO since 2002, by vaccinating the population between 6 months and 14 years of age and increasing coverage. Between May and June 2004, a successful campaign was carried out to vaccinate adolescents and adults of both sexes against measles and rubella, covering 98% of the target population. Circulation of the rubella virus was interrupted in November 2004, when the last laboratory-confirmed case was reported.

Intestinal Infectious Diseases

A **cholera** outbreak of 25 cases was reported at the end of 2003 in the Zamora-Chinchipe province, which corresponded to a rate of 30.8 per 100,000 population in that province. No cases were reported during 2001, 2002, 2004, and 2005.

In 2003, 2004, and 2005 notification rates for **acute diarrheal diseases** were 2.0, 2.4, and 2.7 per 100,000 population, respectively. In 2005, the eastern region had the highest notification rate (5.9), which is twice the national rate. The highest rates in the country by province were: Pastaza, Morona, Napo, and Zamora (36).

Chronic Communicable Diseases

In 2004, **tuberculosis** was the 15th leading cause of death (5.0 per 100,000 population). It was more common among men (7.0 per 100,000 population) than women (3.0). The most affected group was those between 15 and 24 years of age with 1,254 cases, followed by the 25- to 34-year-old age group. Those least affected were in the 0- to 14-year-old age group and those 65 years and older (192 and 237 cases, respectively). That same year 5,557 cases of all forms of tuberculosis were reported (rate of 42.6 per 100,000 population); 4,340 cases had positive sputum smears, and 438 were extrapulmonary tuberculosis. In 2003 and 2004, there was an average of 226 annual cases of AIDS/tuberculosis coinfection (out of a total of 1,806 AIDS cases). Most coinfecting people were from Guayas (76.5%), followed by Pichincha (8.0%); they were predominantly men (73.0%), and 60.6% were workers

and laborers. In 2005, a study on antituberculosis drug resistance showed evidence of primary resistance (5%) and secondary resistance to multiple drugs (24.3%). Coverage for Directly Observed Treatment, Short-course (DOTS), in operating MSP facilities as of 2005 was 100% in Azuay, Pichincha, Guayas, Tungurahua, and El Oro, and 90% in Manabí (which in total represents 70% of the target population defined by the program).

There were 251 cases of **leprosy** reported in 2003, which translated into a rate of 2.0 per 100,000 population. During that year, 189 new cases were reported. In 2004, there were 144, and 116 in 2005 (rates of 14.0, 11.0, and 9.0 per 100,000 population, respectively). The group most affected was those over 15 years of age. Multibacillary cases predominated among men (78%) and paucibacillary cases were more frequent among women (58%).

Acute Respiratory Infections

In 2005, acute respiratory infections were the leading cause of outpatient visits to operating MSP facilities in all provinces, with the exception of Bolívar. The highest rates (26.6 and 18.7 per 100,000 population) were in Napo and Morona. That year acute respiratory infections were three times more frequent than acute diarrheal diseases during outpatient visits (36).

HIV/AIDS and other Sexually Transmitted Infections

As of 2006, Ecuador did not have a study on the prevalence of people infected with HIV. From 2001 to 2005, a total of 2,752 HIV-positive cases were reported (varying from 294 in 2001 to 1,027 in 2005); there were 1,902 cumulative cases of AIDS during that same period (varying from 318 in 2001 to 445 in 2005), and 884 people died. In 2005, 67.9% of people over 14 years old with AIDS were men, and the male-to-female ratio was 2:1, lower than the previous year (3:1). In 2005, the highest AIDS notification rates corresponded to the 30- to 34-year-old age group (8.9 per 100,000 population) followed by 35- to 39-year-olds and 25- to 29-year-olds (8.8 and 8.1, respectively). Among those under 15 years old, 1- to 4-year-olds had the highest rate (1.9 per 100,000 population), and in those over 60 years old it was 1.0 per 100,000.

In 2005, the highest percentage of HIV-positive women and women with AIDS corresponded to housewives (73.9%), followed by sex workers (5.5%). By province, the highest rate of AIDS notification in 2005 was in Guayas, with 6.6 per 100,000 population, followed by Manabí (5.2), Sucumbíos (3.9), Pichincha (3.87), and Cañar (3.17). As of March 2006, a total of 1,093 patients were receiving antiretroviral treatment (887 adults and 206 children). The INEC reported 399 and 422 deaths from AIDS in 2002 and 2003, respectively. In 2003, 82.4% of deaths corresponded to men, and 89.1% to the 15- to 49-year-old age group, followed by the 50- to 64-year-old age group with 9.3% (37).

The HIV/STI National Program began implementing syndrome management for sexually transmitted infections in 2005; as of 2006, there were no consolidated national data. In 2005, the

provinces that reported infections were Guayas, Pichincha, El Oro, Manabí, Loja, and Sucumbíos. The latter province reported a rate of 58 per 100,000 population for **gonorrhoea**, 55 for primary and secondary **sypilis**, and 18 for **genital herpes**.

Zoonoses

In 2005, 23 herds (21 bovine and 2 porcine) were reported as being infected with type O virus **foot-and-mouth disease** (38, 39), with 4,089 animals endangered and 7 deaths; 78% of these incidences were reported in Manabí. As of 2006, Ecuador had no areas free of this disease. National vaccination was reported at 56.2% in 2005.

In 2001, 75 cases of canine **rabies** were reported; from 2002 to 2005, 6, 12, 11, and 2 annual cases were reported, respectively. From 2001 to 2003, the provinces with reported cases were Cañar, Azuay, Cotopaxi, and Tungurahua, and Guayas and Manabí in 2004. Vaccination coverage in 2004 was 82% of the estimated canine population for that year. In 2001, one case of human rabies was reported; no cases were reported during 2002–2004, and in 2005, there were two cases of human rabies caused by bat bites in the province of Pastaza (40).

NONCOMMUNICABLE DISEASES

Malignant Neoplasms

In 2004, the INEC death registry reported that the most frequent malignant neoplasms were stomach with 2.7% (1,484 total: 822 men and 662 women), followed by prostate, 1.2% (636); liver and intrahepatic bile ducts, 1.0% (total 573: 279 men and 294 women); trachea, bronchia, and lungs, 1.0% (569 total: 332 men and 237 women); uterus, 0.7% (409); colon, sigmoid colon, rectum, and anus, 0.7% (401 total: 175 men and 226 women); and female breast cancer, 0.6% (312) (16).

OTHER HEALTH PROBLEMS OR ISSUES

Disasters

Eruptions of the Tungurahua volcano in 1999 and their aftermath led to the evacuation of 25,000 people. Damages were estimated at US\$ 17 million, and tourist industry losses at US\$ 12 million. Various crisis periods between 1999 and 2006 followed that volcanic activity. The eruption of the Reventador volcano in November 2002 compromised close to 40,000 hectares of pastureland and damaged roads and services to access safe water. Lessons were learned about evacuating people in high-risk areas and the effects on the population's health as well as about intervention activities. In winter 2002, close to 28,000 people were affected: 25 died, 1,700 were left homeless, and 1,500 families were evacuated. There was also damage to 5,200 houses and 3,000 educational centers. The rainy season at the beginning of 2006 af-

fected 29,818 families, 1,160 of them with injuries. There were 12 deaths, and five provinces in the coastal region were compromised by the increase in communicable disease morbidity. International support was mobilized to mitigate the impact on health.

Mental Health

In 2005, the main reasons for psychiatric consultations in the MSP per 100,000 population were violence and mistreatment (53.6), alcoholism (23.6), and suicide attempts (15.3) (36). The second national survey on drug consumption, carried out in 2005 by the National Council for the Control of Narcotics and Psychotropic Substances with the support from the Organization of American States (41) among students between 11 and 21 years old, reported that the lifetime prevalence was 61.6% for alcohol consumption, 54.5% for cigarettes, 7.0% for marijuana, and 6.1% for tranquilizers without a prescription. In addition, the age of first-time drug use was between 12.6 and 14.1 years.

Environmental Pollution

The production of flowers and nontraditional crops increased between 2001 and 2005, which caused an increase in the production, marketing, and use of pesticides. In 2004, an estimated US\$ 115.8 million worth of pesticides were imported—2.6 times more than the figure reported for 1992 (42). This same study found in 2003 that the mortality rate of agricultural workers exposed to pesticides was 20.5 per 100,000 population. That year, the provinces of Carchi and Manabí listed acute pesticide poisoning as the ninth cause of morbidity. In 2004 and 2005, the notification rate in Carchi increased from 28.0 to 33.2 per 100,000 population, making it the 10th leading cause of morbidity. In 2005, the provinces of Tungurahua and Orellana reported 35.9 cases of acute poisoning per 100,000 population, making it the ninth leading cause of morbidity. In 2003, the INEC recorded 1,826 hospital visits due to pesticide poisoning; 49.2% of the cases were among the 20- to 44-year-old age group, followed by the 10- to 19-year-old age group with 26.1%. By sex, 48.4% of the cases were men, and 51.6% were women (43).

Oral Health

In 2004, the MSP recorded 1,850,010 dentist visits. In 1995–2003, estimates reported a DMFT (decayed/missing/filled teeth) index of 2.9 (15).

RESPONSE OF THE HEALTH SECTOR

Health Policies and Plans

Ecuador's Constitution, which has been in force since 1998, expresses the Government's decision to recognize health as a right that must be guaranteed, promoted, and protected, as well as permanent and uninterrupted access to health services by people who need them.

The National Health System Law (2002) structures the health system into national, provincial, and cantonal levels and provides for the operation of provincial and cantonal health councils. It also defines the scope of the health system in terms of its leadership, provision of services, and insurance and financing and establishes general rules concerning human resources in health, medications, inputs, and science and technology.

In May 2005, the MSP drafted and distributed its strategic plan for 2005–2006, which had the following objectives: to strengthen the leadership role of the MSP; to carry out the first phase of universal health insurance for the poorest population; to develop a national health system; to control diseases with high epidemiological, social, and economic impacts; to strengthen the services network, especially in the provinces and cantons that have the parishes where the poorest people live; and to carry out intersectoral actions to protect and promote health, primarily in areas related to the environment, schools, food, and nutrition.

The National Health System, through the National Health Council (CONASA), organized two national congresses in 2002 and 2004 on the subject of “for health, for life.” These meetings had a great deal of social participation, and the Government's health policy was developed during them, as was the health agenda to implement it.

The Constitution establishes the State decentralization in Articles 225 and 226. The health decentralization process began in 2001 with issuance of Executive Decree 1616 and formulation of the National Decentralization Plan. The State Decentralization and Social Participation Act has been in force since 1997 and was amended in 2000 and 2003. The law reaffirms leadership strength at the central level and, in turn, promotes the operation of the health councils as coordination bodies to make decentralization a coherent and ordered process. Since March 2004, work has been under way on the draft version of the Health Act, which would substitute for the Health Code (1971).

Health Strategies and Programs

The national health policy is based on the principles of equity, universality, solidarity, quality, plurality, efficiency, ethics, and comprehensiveness. Its main objectives are to promote among citizens the guarantee, respect, promotion, protection, and demand of and for human rights in health for the exercise of a dignified and healthy life; to guarantee comprehensive health protection for the population, facilitating the means to promote both physical and mental health; and to prevent and to address diseases and their causes, mitigating their biological, economic, and social effects.

CONASA and provincial and cantonal governments promoted application of the law to develop the system through the formation of cantonal and provincial health councils and their respective health plans. As of 2006, the MSP was carrying out disease prevention and health protection activities along with providing

care for prevalent morbidity; the Ecuadorian Social Security Institute and the Armed Forces and Police Health Services attended to their members, and the private sector focused on care for morbidity events. The legal framework to modernize the State and the National Health System Law expressly mentions social and community participation as a basic requirement for its implementation and development and recognizes all existing neighborhood and community organizations. Within this context, agreements have been made in the health arena since 2002 to empower the community in decision making in the health councils as well as in committees of users to ensure compliance with the maternal and child health care and family violence prevention laws.

In 2002, the National Health System Law was enacted, which established the general principles and rules for organization and operation of the National Health System. The Social Security Law, in force since November 2001, established the reference framework in this field. Along with approval of the new Constitution in 1998, amendments were made to the Free Maternity and Child Health Care Act in force since 1994. As per its provisions, it is a step toward universal health insurance by ensuring the right of all women to free and quality health care during pregnancy, during birth, and after birth; access to sexual and reproductive health care; and cost-free care for children from birth to 5 years. Ecuador has other specific laws, such as the Law on Patient Rights and Protection, the Law on HIV/AIDS Prevention and Comprehensive Care, the Law on the Provision and Use of Blood and its Derivatives, the Law on Organ and Tissue Transplants, and the Law on Food and Nutritional Safety, as well as amendments to the Health Code and official adoption by the National Commission of the *Codex Alimentarius*. In May 2006, the National Congress ratified the Framework Convention on Tobacco Control.

Organization of the Health System

The public health sector comprises the services of the MSP, which implements traditional health promotion and protection programs: the IESS, the Armed Forces and Police Health Services (divisions of the Ministries of Defense and of Government, respectively), health services for certain municipalities, the Guayaquil Welfare Board (JBG), the Guayaquil Child Protection Society, the Society to Combat Cancer (SOLCA), and the Ecuadorian Red Cross. The Ministry of Public Health is responsible for regulating, supervising, and controlling the sector and has a local office in every province, and, within each one, the Ministry of Public Health has specific sections that provide service in terms of geography and population and which largely coincide with the political and administrative divisions of the canton or municipality. The Ministry of Public Health also carries out a series of health promotion and protection programs and coordinates with the Ministry of Education in implementation of the healthy schools initiative.

The IESS has a personnel membership system, primarily geared toward protecting dependent workers in the public and

private sectors. The social insurance system includes economic resources and medical care, which cover 10% of the population. The Farmers' Social Security system covers workers in rural areas and provides family coverage. It includes the provision of social services, such as death, disability, and pension benefits, as well as primary medical care, which are extended to the country's rural population (37% of the national population). It is estimated that 9.2% are covered. The Armed Forces and Police Health Services offer ambulatory care and hospitalization. The JBG is an autonomous social services agency financed primarily by the national lottery. It has four hospitals: two general and two specialized hospitals located in Guayaquil. SOLCA is a private social agency that covers part of the national demand for the diagnosis and treatment of cancer and is based in regional institutions in the country's main cities, where it operates with administrative and financial autonomy. It has five specialized hospitals. Municipal health services are responsible for health offices that address environmental health and sanitary control problems, with the exceptions of Quito and Guayaquil, which include certain private ambulatory and hospital services.

The private sector (which represents 15% of the country's health facilities) includes nonprofit entities (hospitals, clinics, dispensaries, medical offices, pharmacies, and health care insurance providers) as well as various NGOs, social service associations, and others. To operate, private bodies must be registered and authorized by the Ministry of Public Health. Prepaid medicine providers cover less than 3% of the middle- and upper-income population.

In compliance with the National Health System Law and the recommendations of the Second Congress on Life and Health, the National Office for the Health of Indigenous Peoples of the Ministry of Public Health, along with the Confederation of Indigenous Nationalities of Ecuador, and other private, public, and official agencies created traditional medicine commissions, as well as an intercultural commission to strengthen health care models (4). In 2006, there were activities focusing on interculturalism and development among health systems. Examples include the decentralized canton of Cotacachi in Imbabura; the quality assurance project in Tungurahua, applied in health areas and a provincial hospital (executed by an NGO); health promoters of the agriculture and livestock production cooperative in Napo and Orellana (supported by the Swiss Red Cross); the Borbón health post in the province of Esmeraldas; and the sustainable human development project located in the province of Morona in health areas three and five. In this context, there are also initiatives such as the Jambi Huasi comprehensive health center in Otavalo, Imbabura; the Alli Causai Hospital in Ambato, Tungurahua; and the Andean Alternative Hospital in Riobamba, Chimborazo. Likewise, indigenous health departments promoted works related to the use of ethnobotanic resources in Guayas, the intercultural health model in Azuay (Nabón), and vertical birth and birthing homes in Pastaza (Puyo). The Guamaní health area also provided traditional and alternative medicines and therapies in Quito.

Public Health Services

Various national forums brought together the ideas of the different actors in the sector, which focused on the need for more in-depth governmental reform based on strengthening the deconcentration and decentralization of the health structure, safeguarding the effectiveness of the national health system, strengthening the health authority, and broad and ongoing social participation in developing the family and community health model. In this context, the Ministry of Public Health defined and has been applying since June 2004 a new comprehensive care model based on primary health care.

Evaluation of the Ministry of Public Health epidemiological surveillance system in 2001 identified 47% underreporting of diseases of mandatory notification (44). In response to this underreporting, surveillance systems were developed by program (such as EPI, maternal death, food and nutrition, and vector-borne diseases), by disease (HIV/AIDS, tuberculosis, and leprosy), or by events (maternal deaths and family violence). However, the simultaneous and growing development of information systems (multiple and parallel) limited the comprehensiveness of information and surveillance systems. There were also difficulties and limitations in this area in the Ministry of Public Health's coordination with other institutions providing services, as well as in the systematization, analysis, and use of information for management.

In 2003, the Ministry of Public Health began implementing the comprehensive epidemiological surveillance system (SIVE), which, according to an end-of-year evaluation, covered 60% of the provinces. In 2004, SIVE-Alerta began to be implemented as a more developed system than the previous one. In 2005, the system covered 88% of Ministry of Public Health areas (150 of 169).

The Leopoldo Izquieta Pérez National Hygiene and Tropical Medicine Institute (INHMT), an agency assigned to the Ministry of Public Health, is headquartered in Guayaquil; it has 33 national laboratories and supervises 250 local laboratories. Its areas of action are: being the national center for reference laboratories; making definitive diagnoses in epidemiological surveillance; executing the health registry, which guarantees the quality of products used in Ecuador (medicines, natural products, cosmetics, hygienic products, processed foods, and pesticides); producing biologicals and vaccines; carrying out research in human and animal health; and ensuring the training and education of internal and external human resources. The Institute maintains a structured microbiology laboratory network for the diagnosis of tuberculosis, syphilis, HIV, dengue, plague, leishmaniasis, Chagas' disease, aspergillosis, chlamydiosis, meningococemia, and others. The INHMT certified the processed food laboratory based on rule ISO 17025 and received certification from an external evaluation of the biochemical laboratory in human health during 2003–2005 (45).

Water, sanitation, and solid waste services are the responsibility of the Undersecretariat of Drinking Water and Basic Sanitation of the Ministry of Urban Development and Housing, which exercises the guiding role in this sector via the water and sanitation

national policy. Within this framework and at the request of the Government, PAHO/WHO initiated an intersectoral discussion table on water and sanitation, whose objective was to manage the portfolio of projects to benefit the poorest populations. The Ministry of Public Health was responsible for coordination and the Ministry of Urban Development and Housing (MIDUVI) was in charge of the secretariat.

In 2006, MIDUVI, as the guiding agency in water and sanitation services, recorded national coverage levels of 67% in drinking water, 57% in sanitation, and 51% in solid waste (46). According to United Nations estimates, national coverage was 86% in 2002 (92% urban and 77% rural). The Government slated an investment of US\$ 343 million during 2002–2006 to increase drinking water coverage by 6.5% and sewage services by 11.5% (47).

In 2005, the Hospital Waste Management Program was implemented in 891 public and private institutions. This program is subject to regulations covering management of infectious wastes in health institutions. In addition, the Ministry of Public Health trained and advised nearly 6,000 health workers and professionals on the management of hospital wastes. In 2001, the Stockholm Convention on Persistent Organic Pollutants (POPs) was signed, and, in 2004, it was ratified, carrying with it the responsibility to develop the National Implementation Plan for POP Management, whose goal is to protect the population and the environment from POPs. The plan proposes: monitoring the reduction of polychlorinated biphenyls (PCB), which in 2003 were calculated at 6,000 tons of contaminated oil; eliminating dioxins and furans, with an annual emissions rate of 97.57 g TEQ/y, and completing the elimination of POP pesticides, most of which have been eradicated in the country, although there are still 1,650.81 kg of residual DDT that need disposal.

In September 2005, the Government requested that the United Nations create a mission to examine the feasibility and types of study possible to evaluate the potential impact that spreading glyphosate by aircraft would have on health, the environment, and agriculture on the country's northern border. In response, the United Nations created an interinstitutional mission that began work at the beginning of 2006 and submitted its report during that year. It proposed five studies needed for scientific clarification of the scenario of eventualities that could harm health and the environment as a result of spreading glyphosate herbicides and its compounds by aircraft, as well as short-term projects geared toward improving the basic conditions for comprehensive socioeconomic development of the region.

The Ecuadorian Agricultural and Livestock Health Service (SESA), via the National Commission for the Elimination of Foot-and-Mouth Disease (CONEFA), is the body in charge of monitoring the health situation of Ecuadorian livestock. To this end, SESA has 51 national offices, with the support of 194 local CONEFA committees. The Ministry of Public Health and other sectoral institutions do not have a food safety surveillance system.

In 2003, to integrate programs and strategies on the subjects of food and nutrition, an executive decree was issued, via which

the Comprehensive Food and Nutrition System (SIAN) was initiated. This system focused its actions on the poorest population and was formed by the National Food Program and Comprehensive Micronutrient Program of the Ministry of Public Health, the School Food Program of the Ministry of Education and Culture, and the Feed Yourself Ecuador Program of the Ministry of Social Welfare. In 2005, the Ministry of Public Health reformulated the system and designed a comprehensive complementary food and nutritional program to improve the nutritional state and food situation of the population in the 200 parishes in the country farthest behind in terms of unsatisfied basic needs (48). The strategy included integration and coordination with other programs and projects of the MSP, the Ministry of Education and Culture, and the Ministry of Social Welfare that had been created as social assistance strategies based on the delivery of food supplements. Evaluation of the national food program, in terms of the baby food product “Mi Papilla” geared toward children 6 to 24 months, showed that it improved nutritional status (improvement of weight-for-age) and provided micronutrients (iron, zinc, and vitamin A) (49).

The health sector provided timely responses and leadership in sectoral coordination in the floods in the coastal region (2002, 2005, and 2006) as well as during the eruptions of Reventador (2002) and Tungurahua (2006) and with regard to the continued flow of people over the northern border seeking refuge (2001–2005). The most complex hospitals in provinces at risk of flooding (Guayas and Manabí), volcanic eruptions (Chimborazo, Pichincha, Tungurahua, and Cotopaxi), and massive population flux (Sucumbios, Imbabura, Carchi, and Esmeraldas) had disaster contingency plans, which helped them provide an appropriate response.

In 2001, the National Civil Defense System initiated, along with the appropriate rules and guidelines, the Emergency Operations Center, which encompasses the health sector. The response to emergencies included formation of situation rooms at the regional level and the creation of rapid-response multidisciplinary teams; the coordination of the teams is the responsibility of the disaster focal points in the provincial offices, which have been trained in methodologies to evaluate damages and analyze needs, which has facilitated timely care in emergency and disaster situations. In 2004, the Ministry of Public Health established a National Health Network for Addressing Emergencies and Disasters, led by the Office of Safety Planning for National Development, which is responsible for managing risks and planning the execution of mitigation, prevention, and health care actions in the event of emergencies and disasters.

From 2002 to 2006, PAHO/WHO executed five phases of the project for strengthening the health sector to provide care for the refugee population. A total of US\$ 250,000 were mobilized from USAID, ECHO, and CIDA, in coordination with the Ministry of Public Health, local governments, NGOs, churches, and United Nations agencies (UNCHR and IOM). The project generated results in risk management for emergencies and disasters, hospital

planning, public health surveillance, information systems, comprehensive care for the refugee population, and improvement of the quality of drinking water in at-risk communities on the northern border. Working within the framework of the Bilateral Technical Health Committee, the governments of Ecuador and Colombia implemented the plan to develop the integrated border area in 2005. PAHO/WHO offered support to strengthen public health surveillance, with an emphasis on pesticides and water quality. Between 2004 and 2005, as part of the strengthening of the health sector response capacity and with financing from the Humanitarian Aid Office of the European Commission (US\$ 400,000), PAHO/WHO developed a project on preparedness for volcanic eruptions for Ecuador and Colombia. The project’s technical materials were later used by countries in Central and South America. During 2002–2006, United Nations bodies in Ecuador established an interinstitutional technical group to respond to emergencies caused by floods, volcanic eruptions, mass displacements, and related occurrences.

In 2005, a national contingency plan was developed to confront a possible influenza pandemic in Ecuador; the plan was interinstitutional in nature and included operating guides and strategies to address this threat during prepandemic and pandemic periods. The plan included specific coordination actions among ministries (Ministry of Public Health, Ministry of Agriculture, Ministry of the Environment, the Ecuadorian Agricultural and Livestock Health Service) and among sectors (Ministry of Governance, poultry businesses, and social communication media). It also received contributions from bodies of the United Nations system—particularly PAHO/WHO and FAO. The major components of the plan were: epidemiological surveillance, preparation of health services, and a strategic communication and social mobilization plan. In 2006, vaccination against seasonal flu was initiated (with resources allocated in the Ministry of Public Health budget) (50). National investment in this area began in 2006, and budgetary allocations were made for 2007. Before the entry in force of the International Health Regulations in 2007, health authorities assumed voluntary and immediate compliance with the provisions related to bird flu and a possible influenza pandemic.

Individual Care Services

The resolution capacity of the Ministry of Public Health’s services is organized according to level of complexity. At level I (basic complexity), there are 434 posts, 1,122 subcenters (774 rural and 348 urban), and 153 health centers, which offer ambulatory care, health promotion, disease prevention, and health recovery; all promote basic environmental health and community participation actions, and the subcenters offer care during birth and emergencies as well as dental care. At level II (intermediate complexity), there are 90 basic hospitals and 23 general hospitals, which, in addition to level I care, provide short-term hospitalization. The basic hospitals provide ambulatory and hospital care in

Intersector Integration for Food Safety

The Comprehensive Food and Nutrition System (SIAN) was launched in 2003 to carry out integrated actions in the area of diet and nutrition to protect the most vulnerable groups in the neediest urban and rural areas. In 2005, the system was reformed and an integrated plan for food and nutrition supplements was designed, composed of the following programs:

- The Ministry of Public Health's Supplementary Food Program that assists pregnant and breastfeeding women and children under 3 years old with the food supplements "Mi Bebida" and "Mi Papilla."
- The Ministry of Public Health's Integrated Micronutrient Program, with subprograms for micronutrient supplements (iron, folic acid, vitamin A) and the subprogram to fortify wheat flour with micronutrients.
- The Ministry of Education and Culture's School Food Program which covers the school population from 6 to 15 years of age.
- The Ministry of Social Welfare's food program (Alimentate Ecuador) that assists the child population between 4 and 5 years old, persons with disabilities, and older adults.

The evaluation of "Mi Papilla," (a precooked product that requires only the addition of clean drinking water to prepare, and provides 100% of the daily requirement of iron, folic acid, and zinc; 60% of the vitamin C, the vitamin B complex, and magnesium requirement; and 30% of the vitamin A, calcium, and phosphorus requirement) indicated that it has had a beneficial effect on nutritional and micronutrient status, principally iron, in the population under 2 years of age.

general medicine, gynecology and obstetrics, pediatrics, and emergency surgery; the general hospital also offers, in addition to those items mentioned, some specialization in keeping with the epidemiological profile of its area of influence and has auxiliary diagnostic and treatment services. At level III (high complexity), there are 14 specialty hospitals and 1 reference hospital for care of the local, regional, and national populations. They also provide educational training and carry out health research.

In terms of the functional organization of the Ministry of Public Health, there were three levels in 2005: health areas (169), the provincial level (22), and the national level (1). The health area comprises the management unit and operating units at the first and second levels, with the ability to resolve technical, administrative, and financial issues. The provincial level includes the provincial health office whose role to provide technical and administrative support to the area divisions and to the hospitals in its geographic jurisdiction. The guiding agency of the health sector is at the national level and incorporates the different processes responsible for creating and distributing technical, administrative, and financial rules applied at the national level. The IESS administers 5 level I hospitals, 10 level II hospitals, 3 level III hospitals, 25 ambulatory centers, 42 ambulatory units, and 348 rural social security dispensaries.

In 2003, there were 33 blood banks in Ecuador, and 79,204 units of blood were collected (29.9% were voluntary donations, and the rest were replacement donations), all of which were tested for *Trypanosoma cruzi*, syphilis, hepatitis C, hepatitis B surface antigen, and HIV. Prevalence of these markers was 0.36% for

T. cruzi, 3.90% for syphilis, 0.35% for the hepatitis C virus, 0.15% for the hepatitis B surface antigen, and 0.28% for HIV (51).

In 2006, the Ministry of Public Health requested that the country be incorporated into the CARMEN regional proposal for the control of noncommunicable diseases. That same year, there were no data on this group of diseases.

Health Promotion

In 2004, CONASA formed a health promotion commission to coordinate and guide intersectoral promotion actions. In 2006, discussion began on the national health promotion policy (52), with participation of the Ministry of Public Health, the Ministry of Education, the Ministry of Environment, the Association of Municipalities of Ecuador (AME), universities, certain local governments, NGOs, and other institutions. The Ecuadorian network of schools that promote health is coordinated by the Ministries of Education and Health and by PAHO; it is supported by other national and international organizations. In 2004, it registered more than 3,000 schools that promoted the development of ecolubs. The network of ecolubs promotes community participation and social communication in the control of dengue, malaria, and other diseases and risks (53).

The Loja project on healthy spaces ended in 2002. It generated local knowledge and experience in health promotion. In 2006, the network of healthy municipalities, coordinated by AME and the Ministry of Public Health and supported by PAHO, was made up

of more than 20 municipalities. That same year, a ministerial agreement was approved to establish the promotion of physical activity and healthy eating, focused on regulating the places where food is provided in schools and on combating sedentary lifestyles.

Health Supplies

The basic lines of the medication national policy (1999) are geared toward guaranteeing availability, access, quality, rational use, and low prices of medicines. The Law on the Production, Importation, Marketing, and Sale of Drugs for Human Use of 2000 establishes rules geared toward expanding the use of generic medications, providing incentives for national production, and facilitating their registry through a uniform procedure for imported products. In 2004, the Ecuadorian pharmaceutical market (87% private and 13% public) had approximately 225 laboratories, 170 distributors, 5,000 pharmacies, and 6,439 products (1,539 of them generic) (54, 55). The private market grew 35.8% during 2001–2005 (from US\$ 407,079 million to US\$ 553,157 million) (56). The number of generic products increased from 16.2% in 2001 to 25.2% in 2005; sales volume in 2005 did not surpass 11.3% of the total, due, among other reasons, to a lack of trust among those issuing the prescriptions because there was no guarantee of the quality and safety of these products. In 2004, it was estimated that approximately 80% of medicines were obtained and consumed without a prescription. The National Commission on Medicines and Inputs of CONASA updates, publishes, and distributes the national list of basic drugs biannually. The fifth version was published in 2004, and, in 2006, the sixth was approved. The medicines included in that list are of mandatory use in all public health institutions and reference institutions for the private sector.

In 2006, the country produced vaccines against DPT (diphtheria, whooping cough, and tetanus), DT (diphtheria and tetanus), BCG (antituberculosis), rabies for human use and for veterinary use (modified suckling mouse brain vaccine), and antivenin serum (against poisoning by snakes of the genus *Bothrops*, and species *asper*, *atrox*, and *xantograma*). Good manufacturing processes were implemented that year.

In 2004, based on primary health care and the comprehensive health care model, the Ministry of Public Health coverage extension program developed and applied a licensing system for level I and level II health units in the 200 poorest parishes in the country (in terms of unmet basic needs), mobilizing financial resources (US\$ 6,600,000) and updating and equipping the units (57). It also trained human resources at the technical and administrative support levels and identified the target population.

Human Resources

In 2001, the female-to-male ratio was 1.8:1 in schools of medicine, nursing, obstetrics, and medical technology. That year,

physicians and dentists tended to be concentrated in urban areas, while nurses and obstetricians were more often in rural areas. In 2003, for every 10,000 population, there were 15.6 physicians; 5.3 nurses; 1.7 dentists; 1.8 obstetricians; and 9.8 nursing assistants. That same year, the lowest rate of physicians was in Orellana (5.4) and the highest was in Azuay (26.6). In terms of nurses, the province of Orellana had the lowest rate (1.8) and Pichincha the highest (9.8). A 2004 study carried out in four universities in Quito and Cuenca concluded, at the time of the study, that of the total physicians and nurses trained in 2001, 9.8% had left the country, and 34.8% had plans to travel abroad (58). In 2005, there were 18 universities for training medical professionals, duly recognized and accredited by the National Higher Education Council. Between 2001 and 2005, 5 institutions for training dentists, 2 for nurses, and 1 for obstetricians were created. As of 2005, higher education centers that included intercultural subjects were Universidad Andina Simón Bolívar and the Universidad Intercultural de las Nacionalidades y Pueblos Indígenas Amawtay Wasi, both in Quito.

Since 2001, the National Health Human Resources Commission of CONASA has been responsible for the Human Resources Observatory in the country. In addition, this body created the draft law of the Health Career Law (2006), which was submitted to CONASA. As of 2006, the Ministry of Public Health was developing permanent health education projects and programs.

Given that, in 1992, the creation of posts in Ministry of Public Health services was halted, in 2003, the Ministry of Public Health employed 54.6% of physicians working in the sector; 59.6% of nurses, 68.8% of dentists, and 94.6% of obstetricians. In that same year, the distribution of health professionals working in the public sector corresponded to 49.95% of physicians, 81.86% of nurses, 91.82% of dentists, and 80.95% of obstetricians (59).

Research and Technological Development in Health

The MSP, through its scientific and technological processes, plays the guiding role in scientific and technological research and development in health. To this end, it has the support of the National Secretariat of Science and Technology, the National Science and Technology Commission of CONASA—which in 2006 formulated the health research policy considered by CONASA—the National Council of Universities and Polytechnic Schools, and other national and international organizations. The National Forum on Health Research brings together researchers and institutions related to health research and initiates research policies geared toward national priorities.

The investment in research and development in 2003 was 0.07% of the GDP. Because of its importance as an instrument for the country's social and economic development, the Government decided to invest in science and technology, which is why it appropriated 5% of existing funds in the Special Account for Productive and Social Reactivation—US\$ 8 million in 2005 and US\$ 26 million in

2006, in each case approximately 14% of the total for health—for activities related to science, technology, and innovation (60).

Since its inception in 1998 up to 2003, the Virtual Health Library (VHL) opened seven cooperating centers, which regularly receive and send information to expand the VHL database (61); in addition, an information network was organized with four centers located in different universities and a coordinating center for areas. In January 2006, the national policy on science, technology, and innovation was published (60).

Health Sector Expenditures and Financing

In 2004, 50.4% of total health spending came from the public sector (Ministry of Public Health, IESS, Armed Forces and Police Health Services, and sectional governments) and 49.2% from the private sector. Ninety percent of the total private health spending corresponded to direct household spending (61% for the purchase of medications and inputs; 24.3% for medical care; and 4.7% for laboratory exams, dental materials, and orthopedic devices); the remaining 10% is direct payment to medical providers. In terms of private expense, 74.7% was carried out in urban areas, and 25.3% in rural areas, where 37% of the population lives, more than 50% of which is poor. Public social spending in health as a percentage of the GDP went from 0.6% in 2000 to 0.8% in 2001, 1.2% in 2002, and 1.5% in 2004. In the public sector, health spending allocated 81.2% for curative care and 18.8% for preventative care. Moreover, spending on primary care was 34.1%, with 29.9% on secondary care, and 36% on tertiary care. Of this spending, 34.4% corresponded to the provision of hospital services, 29.3% to the supply of medicines, 23.6% to ambulatory services, 11.7% to public health, and 0.9% to research. Only 31.8% was geared toward the poor, and the rest received 68.2%. The MSP budget has been constantly increasing from 2001 (US\$ 151.7 million) to 2006 (US\$ 561 million), going from 2.8% of the general budget for the State in 2001 to 6.0% in 2006 (3). The proposed budget submitted for 2007 was US\$ 845 million (8.3%) of the national budget.

Technical Cooperation and External Financing

In 2003, Ecuador received US\$ 811 million in international cooperation, 79.6% in external loans and 20.4% in nonreimbursable funds. In 2004, this amount dropped to US\$ 555 million, of which 67.3% corresponded to external loans, and 32.7% to nonreimbursable funds. The total amount of bilateral cooperation during 2003–2004 fluctuated between US\$ 105 million in 2003 and US\$ 102 million in 2004, while multilateral cooperation increased 40% from US\$ 26 million in 2003 to US\$ 36 million in 2004. Cooperation from nongovernmental organizations increased 23% from 34 million in 2003 to 42 million in 2004 (62). Multilateral cooperation primarily focused on the social welfare

sector (nine cooperation partners); education, science, and technology (eight cooperation partners); and the environment, natural resources, health, and sanitation (seven cooperation partners). In terms of financing awarded for projects during 2003–2004, the European Commission was the main donor at 8.6% of the total amount (US\$ 12.31 million).

During 2001–2005, PAHO/WHO cooperation focused politically and technically on strategic processes that contributed to health development. The most important achievements were approval of the National Health System Law and its later implementation. During implementation, the law supported the regulatory process, the development and strengthening of the CONASA board of directors and its technical commissions (intersectoral in nature), and cantonal and provincial health councils, as well as an increase in the public health budget.

In 2003, the pentavalent vaccine (diphtheria, whooping cough, tetanus, hepatitis B, and *Haemophilus influenzae* type b) was introduced. The vaccine against seasonal flu was incorporated for at-risk groups, and financing was approved for a vaccine against rotavirus for 2007. During this period, Ecuador remained free of poliomyelitis, and measles, diphtheria, rubella, congenital rubella syndrome, and neonatal tetanus stopped being a public health problem. PAHO supported the Ministry of Public Health in strengthening and decentralizing the National Malaria Program and in developing research on resistance to insecticides and antimalarials. There was intersectoral collaboration with regard to dengue, headed up by the Ministry of Public Health and involving the participation of the municipalities, the Ministries of Education, Governance, and Defense, and the organized community, which aided in the rapid control of outbreaks and a decrease in the number of deaths.

In addition, PAHO supported the response to emergencies and disasters caused by floods and volcanic risks. The Ministry of Public Health strengthened the decentralization of the National Disaster Preparedness, Response, and Mitigation Program. International resources were mobilized to mitigate disasters, primarily flooding on the coast, and interinstitutional work was encouraged for the coordinated response of the international community. Recognized leadership was developed by all the national and international actors, and intersectoral and interinstitutional work was promoted along the border with Colombia. Participants in the latter included the MSP, the Ministry of Housing and Urban Development, and the International Organization for Migration to ensure monitoring of water quality at treatment plants and in storage networks, and to guarantee drinking water for the population without access to it through the use of appropriate technology and community participation; this experience was also carried out among populations in the poorest parishes in the country. Ecuador was advised on the creation of national policies for compliance with the MDGs and implementation of universal health insurance, as well as the preparation of reports and practical plans related to the MDGs in general and to health in particular.

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