

# CHILE



Chile is situated in the extreme southwest of South America, bordering Peru, Bolivia, and Argentina. Continental Chile has a length of 4,329 km and an average width of 177 km. Its continental and insular surface area is 756.626 km<sup>2</sup>, and its Antarctic territory covers 1,250,000 km<sup>2</sup>.

## GENERAL CONTEXT AND HEALTH DETERMINANTS

The country is divided into 13 political-administrative regions: Tarapacá (I); Antofagasta (II); Atacama (III); Coquimbo (IV); Valparaíso (V); the Santiago metropolitan region (RM); Libertador General Bernardo O'Higgins (VI); Maule (VII); BioBío (VIII); Araucanía (IX); Los Lagos (X); Aisén del General Carlos Ibáñez del Campo (XI), and Magallanes and the Chilean Antarctic (XII).

### Social, Political, and Economic Determinants

Chile's economy has continued to experience solid growth, with a GDP of 6.1% in 2004. The inflation rate decreased from 4.5% in December 2000 to 2.4% in December 2004. Unemployment figures, however, have only marginally improved since 2000. According to Chile's Central Bank, the country's unemployment rate was 8.8% in 2004. The natural resource sectors that have been specifically associated with the economic upturn include mining, forestry, and agriculture.

Environmental protection concerns have been mounting on critical issues such as air quality in the Santiago metropolitan region and in areas surrounding copper smelting facilities located in the northern part of the country. Chile has progressively strengthened its environmental policies based on a model of multi-sector environmental coordination.

The adult population is very concerned about environmental and social problems, as evidenced by the fact that environmental pollution and sanitation rank second and problems associated with alcohol and drug addiction rank third among perceived problems. According to a national survey on socioeconomic conditions (CASEN 2003), potable water coverage nears 100% in urban areas and exceeds 90% in more densely populated rural areas; 96.1% of households have electricity coverage; and only 2.7% of households lack access to excreta disposal systems in urban areas, while this figure increases to 3.5% in rural areas (1). By 1994, nearly 100% of the urban population had regular residential trash collection service. Some urban sanitary landfills were closed as they reached the end of their useful life. As municipalities have outsourced their trash collection services, prob-

lems have emerged, because there are only a few companies controlling the market.

The Ministry of Planning and Coordination, using the CASEN survey, assesses the country's poverty levels and the coverage, distribution, and impact of social protection programs. In Chile, people are considered "poor" if their income falls under a minimum necessary to meet basic needs; persons are considered indigent when they cannot satisfy their nutritional needs. Between 2000 and 2003, absolute poverty—or the sum of non-indigent poor plus the indigent population—decreased by 1.8%, for a rate of 18.8% at the end of 2003. This stands in sharp contrast to the 38.6% rate seen in 1990. Rural poverty and indigence are always greater than in urban areas. In 2003, the income of the wealthiest 20% of Chileans was 14.3 times higher than that of the poorest 20%. Upon factoring in all government financial and non-financial subsidies, the figure falls to 7.6%. In 2003, 31.6% of the country's indigenous population in rural areas lived below the poverty line; 27% of indigenous peoples in urban areas lived below the poverty line.

In 2002, there were 11,226,309 persons 15 years old and older, of whom 5,877,149 made up the workforce, accounting for a 27.2% increase with respect to 1992 census data. The number of females in the workforce increased by 7.5%, while the number of males decreased by 1.5% over the same period.

Since 2000, job creation activity has been more vigorous, and there has been a moderate but sustained decrease in unemployment. Women, young people, and low-skilled workers face significant obstacles to their insertion into the job market, as well as greater job instability. Women in the workforce are subject to employment discrimination by different sectors and in their wages, with most female job opportunities being limited to the services sector. Managerial jobs are largely occupied by men and the average hourly salary received by women is 20% less than that of their male counterparts. Since 1994, the percentage of young people in the job market has been declining, while unemployment rates have remained high. From a geographical standpoint, the highest employment rates during 2002 occurred in the Santiago metropolitan region (43%), and in regions VIII (11%) and V (10%).

During 1992–2002, the housing stock increased (30.6%), with the largest rise (34.2%) occurring in urban areas, as compared to 13% in rural areas. The stock of permanently occupied housing

increased by 31.6%, while temporary housing decreased by 48.2%, which indicates that the population has better access to more stable housing arrangements (2).

In 2002, the literacy rate among the population over age 10 was 98.5%, nearly evenly distributed by sex throughout the country (2). Upon comparing data from the previous census (1992), a slight improvement was observed (1.2%), with increases in the levels of preschool (children under age 5 years old), basic, and higher education. Preschool education coverage has increased, and 1 of every 3 children currently has access to this type of education. Chileans attend school an average of 10.2 years, ranging from 8.7 years in region VII to 11 years in the Santiago metropolitan region. The literacy rate is lower among indigenous groups, especially among women, 10.4% of whom can neither read nor write, according to the CASEN 2003 survey (3).

Civic engagement among the adult population is low—55% of adults 15 years old and older do not belong to any organization. Local citizen action groups have the highest membership and participation, followed by religious and sporting groups. Moreover, only 57% of adults claim to have social networks that offer emotional and material support.

### Demographics, Mortality, and Morbidity

According to 2002 census data (2), Chile has a population of 15,116,435; 7,447,695 are male and 7,668,740, female. In terms of the total population, persons under 15 years of age account for 25.7%, and those aged 60 years and older, for 11.4%. Population density is 20.4 inhabitants per km<sup>2</sup> and the average age is 30.04 years. Between 1992 and 2002, Chile's annual population growth rate was 1.2% (0.6 percentage points lower than the growth experienced over the previous decade). Rural dwellers account for 13.4% of the country's population; the urban population (86.6%) is concentrated in the Santiago metropolitan region and in regions VIII (12%), V (10%), and X (7%). According to the 2002 census, 4.6% of the population reported belonging to one of eight indigenous groups recognized by the country's Indigenous Law: 87.3% belong to the Mapuche community and 7% to the Aymará. The number of resident aliens in the country was reported to be 184,064, or 1.2% of the total population; 77.1% are immigrants from other countries of the Americas, including Argentina, Peru, and Bolivia.

The country's birth rate has steadily declined, and was estimated at 15.5 births per 1,000 population in 2003 (3). Infant mortality has followed a similar trend, and was 7.8 per 1,000 live births in 2003, as illustrated in Figures 1 and 2. In addition, life expectancy at birth in 2005–2010 was estimated at 78.5 years.

Mortality indicators come from the National Statistics Institute's (INE) vital statistics registries and cause-of-death codes of the International Classification of Diseases, 10th revision (ICD-10) (Ministry of Health). The most recent published fig-

ures (2003) (3) reveal sound quality indicators: 98.9% of deaths are medically certified, and only 2.8% are coded as ill-defined (R00–R99). In 2003, there were 83,672 deaths, for a crude general mortality rate of 5.25 per 1,000 population. Age-adjusted mortality for the standard world population is 5.0 per 1,000 population. By and large, a downward trend in the age-adjusted mortality rates was observed between 2000 and 2003 (5.17 and 5.0 per 1,000 population, respectively). Differences by sex remained constant in these years for all age groups, with excess male mortality of 1.2%. Figure 3 shows the leading causes of death per 100,000 population by broad groups of causes.

In 2000–2003, maternal mortality decreased from 1.9 per 10,000 live births (49 deaths) to 1.4 (35 deaths), which was attributable to a decrease in maternal mortality due to abortion from 0.5 per 10,000 live births (13 deaths) to 0.3 (7 deaths). Fetal mortality in 2003 was 5.7 per 1,000 live births; it has experienced a sustained increase since 1999 (rate of 4.1 per 1,000 live births). There were 909 late fetal deaths (rate of 3.9 per 1,000 live births) in 2003, which represents a sizable reduction in comparison to the figures from 1998 (rate of 4.3 per 1,000), taking into account that these rates had remained stable from 1978 through 1988, and from 1988 through 1998.

Between 1983 and 2003, the total fertility rate decreased from 2.5 children per woman to 1.9. In 1983, the fertility rate was highest among 20–24-year-olds (137.6 per 1,000 women), whereas it was highest among 25–29-year-olds (100.6 per 1,000 women) in 2003. The desired fertility rate is 2.76 children, which is not much different from actual fertility data captured by the 2002 census. Among the population with low socioeconomic status, the rate approaches 3.2 children per woman (2003), which indicates that this group will bear more children than the desired rate due to a lack of access to family planning information and programs.

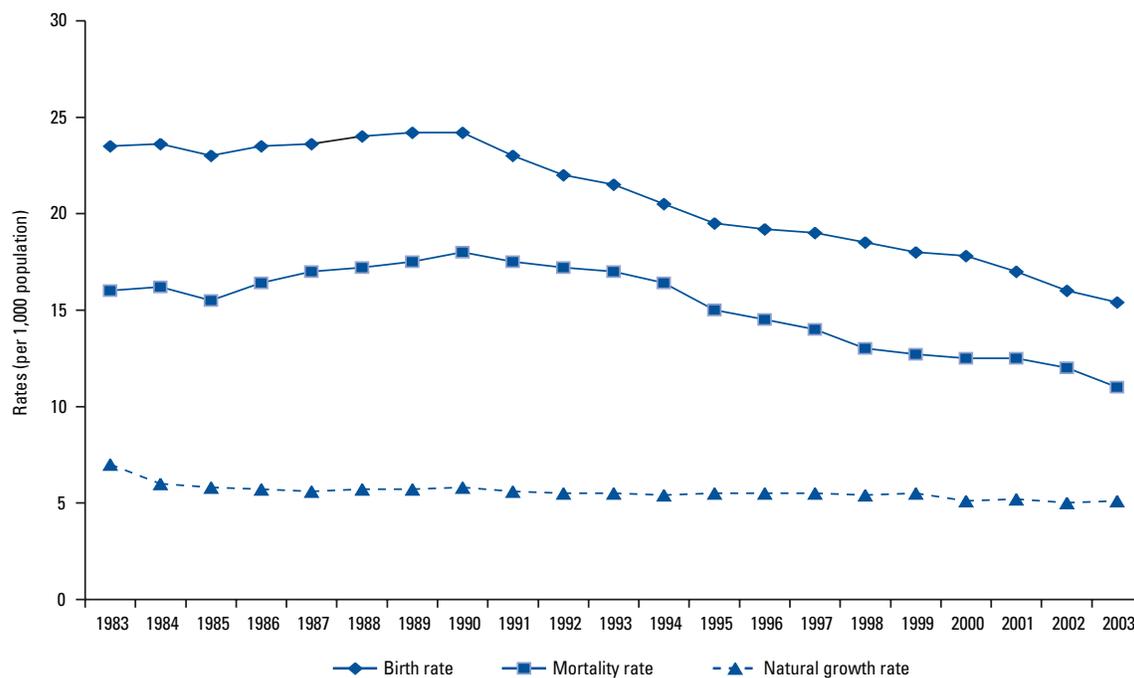
The 2003 National Health Survey (ENS 2003) reveals elevated rates of morbidity from adult chronic diseases, which account for most of the disease and mortality burden. Mortality from cardiovascular disease, diabetes, and cancers combined accounts for 58% of deaths in the country (4). The 2000 National Quality of Life and Health Survey (ECV 2000) showed that the general population was well satisfied with their health (greater than 5 on a scale from 1 to 7); women and population groups with low socioeconomic status were less satisfied, however (5).

## HEALTH OF POPULATION GROUPS

### Children under 5 Years Old

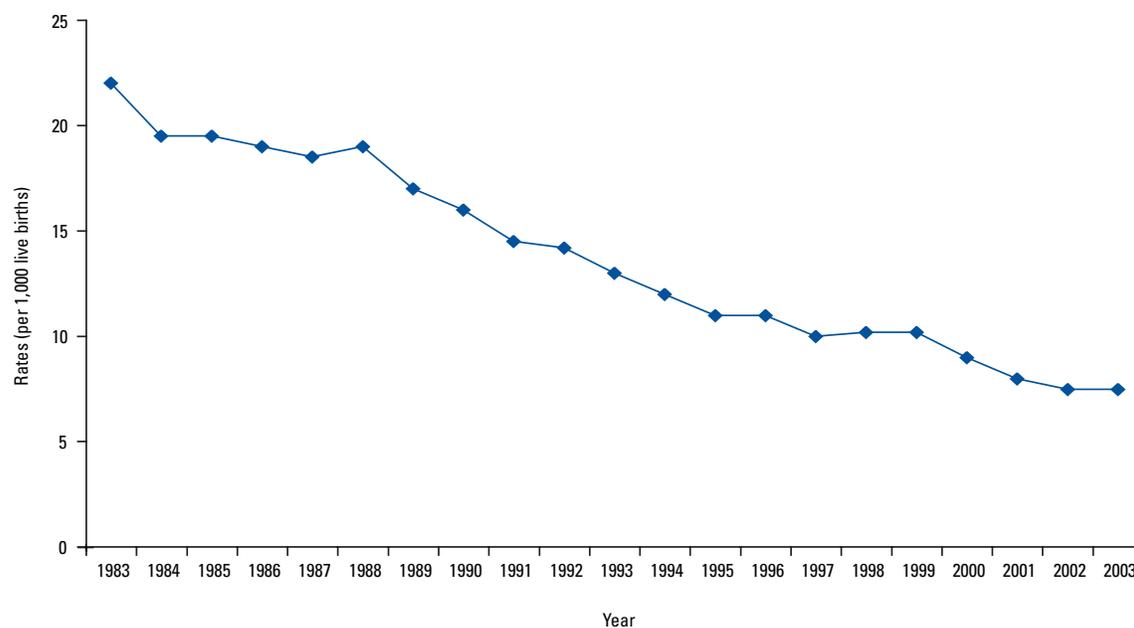
There were 1,935 deaths in children under the age of 1 year in 2003, accounting for 2.3% of total deaths and an infant mortality rate of 7.8 per 1,000 live births. The decrease in infant mortality has been mainly due to reductions in late infant mortality. In 2003, neonatal mortality accounted for 64% (4.9 per 1,000 live births) of

**FIGURE 1. Birth, mortality, and natural growth rates, Chile, 1983–2003.**

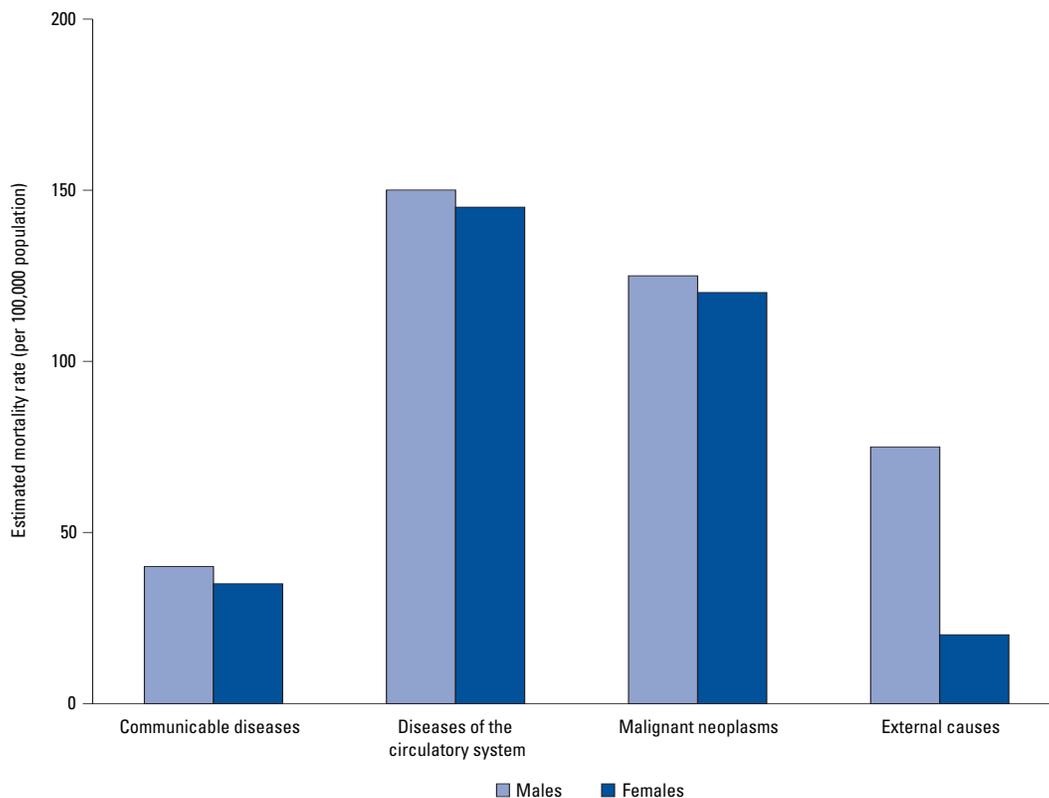


*Source:* Instituto Nacional de Estadísticas, INE (2003). Anuario de Estadísticas Vitales 2003.

**FIGURE 2. Infant mortality rates, Chile, 1983–2003.**



*Source:* Instituto Nacional de Estadísticas, INE (2003). Anuario de Estadísticas Vitales 2003.

**FIGURE 3. Adjusted mortality rate,<sup>a</sup> by broad groups of causes and by sex, Chile, 2000–2003.**

<sup>a</sup>Adjusted by world population.

**Source:** Ministerio de Salud, Departamento de Estadísticas e Información en Salud.

infant deaths and 75% (723 deaths) of these occurred during the first week of life. Studies on infant mortality in the country's regions reveal fluctuations ranging from 9.6 per 1,000 live births in the Aisén del General Carlos Ibáñez del Campo region to 7.1 in the Atacama and Santiago metropolitan regions. The leading specific causes of death among children under 1 year old are: extreme prematurity, congenital heart defects, pneumonia, sudden infant death syndrome, and central nervous system defects, which together account for 48% of all deaths in this age group.

Approximately 5.2% of newborns weigh less than 2,000 g and 16.5% have low birthweight (between 2,500 and 2,999 g). These figures have remained relatively stable in recent years. Very-low-birthweight infants (less than 1,500 g), while representing only 0.9% of all births, nevertheless account for one-third of infant mortality. The survival rate for this group is 69%, ranging between 8% of newborns weighing 500–599 g and 90% of those weighing 1,250–1,499 g. With respect to hospital discharges for this group, most were due to certain conditions originating during the perinatal period (36.8%), followed by diseases of the respiratory system (31.4%), infectious and parasitic diseases (7.4%), and congenital birth anomalies, deformities, and chromosomal abnormalities (5.4%).

In 1990, a national program was launched to reduce mortality from acute respiratory infections (ARIs) among children under 1 year old. The program reduced the mortality rate from 23.9 per 1,000 live births in that year to 3.4 per 1,000 by 2003. Pneumonia in children under 1 year old accounts for 90% of total deaths from acute respiratory infections (ARIs), and remains the leading cause of preventable childhood mortality. Bronchiolitis obliterans syndrome is the leading cause of hospitalization, accounting for 23% to 25% of all pediatric morbidity medical consultations in Santiago, and affecting one-quarter of all children under 1 year old. With regard to congenital anomalies, Chile gives priority to two conditions: central-nervous-system and cardiovascular anomalies. Data from maternity wards of the Santiago metropolitan region show a decrease on the order of 40% in the incidence of neural tube closure defects. Chile's program of flour fortification with folic acid, implemented in 2000, is credited with this accomplishment. Cleft palate represents another significant problem, with an estimated incidence of 1.8 per 1,000 live births. In 1992–2004, the country's mass phenylketonuria and hypothyroidism screening program performed 1,780,457 tests (100% coverage), identifying 644 children carrying congenital hypothyroidism (incidence of

1 per 2,764 newborns) and 114 carriers of classic phenylketonuria (incidence of 1/15,618 newborns).

According to data compiled by the Ministry of Health's nutritional evaluation and surveillance system, the prevalence of malnutrition among children under the age of 6 years has been declining over the past ten years and remains stable to date. Moreover, between 1990 and 2003, an increase was observed in overweight and obesity, while figures on overweight remained stable in 2004 and 2005, at 15% and 7.4% respectively.

It is estimated that at least 16% of children younger than 2 years are afflicted with delayed psychomotor development. Although child abuse is underreported, it is estimated that half of children under age 6 years have been subjected to severe mistreatment. The United Nations Children's Fund estimates that 74% of Chilean children are exposed to or have experienced violent situations within their families (6).

### Children 5–9 Years Old

The age group 5–9 years old accounted for only 0.3% of deaths in 2003 and, consequently, had the lowest mortality rate, at 0.17 per 1,000 population. Boys accounted for 59% of such deaths. Reported deaths in 2003 were due primarily to external causes (35.2%); malignant tumors (17.6%); and congenital anomalies (10.8%). Among specific external causes, traffic accidents were responsible for 45.5% of deaths. With respect to deaths related to malignant neoplasms, different types of leukemia were responsible for 45.5%. In terms of hospital discharges for this age group, most were attributable to diseases of the respiratory system (26.3%), followed by diseases of the digestive system (14.2%); infectious and parasitic diseases (7.4%); diseases of the genitourinary system (7.0%); malignant neoplasms (5.5%); and congenital anomalies, deformations, and chromosomal abnormalities (5.1%). Among patients discharged for respiratory system diseases, 23% were pneumonia related; among digestive diseases, 55% were for appendix-related conditions; and among infectious and parasitic diseases, 53% were for diarrheal diseases.

A study of schoolchildren conducted by the Ministry of Health's National Organization for Student Aid and Scholarships found that 5.9% of the sample studied was hyperactive in the home environment, 4.2% at school, and 1.2% in both. With the aid of tools designed to detect mental health problems in elementary schoolchildren through teacher-parent observation, such as the Teacher Observation of Classroom Behavior-Revised (TOCA-R) and the Pediatric Symptom Checklist (PSC), the checklist was administered to the aforementioned sample and showed that 11.9% of the girls and 17.1% of the boys were at risk for developing mental health problems. The study revealed that in 30% of cases, the father does not live in the home with the child; 54.2% of families do not participate in social activities; 17.2% of families have a child required to be absent from school frequently; and 9.4% have a family member receiving treatment for some form of mental illness (7).

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

The mortality rate among adolescents 10–19 years old is 0.33 per 1,000 population. Mortality in this group (934 deaths) accounts for 1.1% of total deaths. The leading causes of death per 100,000 population by broad groups of causes are: external causes (17.2), malignant neoplasms (4.5), and diseases of the nervous system (3.1). Most hospital discharges in this group were due to diseases of the digestive system (13.1%), followed by diseases of the respiratory system (7.3%), diseases of the genitourinary system (5.1%), and malignant neoplasms (4.4%). In 2003, there were 34,832 live births to women under 20 years old. The women in this age group accounted for 14.9% of total live births, representing a significant decrease with respect to the 16.2% figure reported in 2001. Between 1993 and 2003, the specific fertility rate among adolescent females decreased from 63.9 children per 1,000 adolescents to 54.7. The number of pregnant adolescents accounted for in the National Health Services System (SNSS) remained stable between 2002 (21.1%) and 2004 (21.7%). The country's 2003 national youth survey revealed that 33.1% of adolescents 15–18 years old had been sexually active; 6% of women 15–17 years old had already borne children; 80.4% of women 15–20 years old who had given birth were not currently studying; and 31.6% of persons 15–29 years old had initiated sexual relations at age 15 or younger (8).

According to the 2003 Global Youth Tobacco Survey, schoolchildren have very high smoking rates, especially young women (9). According to the National Drug Control Council, drug abuse prevalence rates among adolescents from the highest-income families double those of young people from the lowest-income families (9), which is consistent with the difference in the consumption pattern of adults observed in the National Health Survey (2003). The prevalence of illegal drug use among adolescents 12–18 years old decreased from 8.6% in 2000 to 6.5% in 2004. In contrast, persons 19–25 years old continued to have high rates of drug use between 2000 (16.3%) and 2004 (16%). Use of all types of illegal drugs by women increased. In 2004, the Tarapacá and Santiago metropolitan regions had the highest drug use rates among the general population. The 2003 National Child Labor Survey revealed a 7.1% prevalence rate of "unacceptable work" among adolescents 15–17 years old, defined as work that prevents young people from studying or that requires them to work at night, outdoors, or involves excessive working hours.

### Adults 20–64 Years Old

In 2003, there were 7,273 deaths among 20–64-year-olds, accounting for 8.7% of total deaths and a mortality rate of 1.2 per 1,000 population. The leading causes of death per 100,000 population by broad groups of causes are: external causes (51.9), malignant neoplasms (20.3%), diseases of the circulatory system (12.2), and diseases of the digestive system (9.1). The leading reasons for hospital discharge in this age group were diseases of the digestive system (9.5%), followed by diseases of the genitourinary

system (6.9%) and malignant neoplasms (5.1%). The mortality rate in the age group 45–59 years old was 4.6 per 1,000 population, with 11,288 deaths, which accounted for 13.5% of total deaths. In 2003, the distribution of mortality by broad groups of causes in this age group was malignant neoplasms (146.6 per 100,000 population), diseases of the circulatory system (105.1), diseases of the digestive system (63.3), and external causes (62.2). The leading causes for hospital discharges in this age group were diseases of the digestive system (18.2%), malignant neoplasms (15.0%), diseases of the genitourinary system (11.7%), diseases of the circulatory system (10.9%), and diseases of the respiratory system (5.2%).

The mortality rate for the age group 60–64 years old was 11.6 per 1,000 population, which accounted for 7.4% of total deaths (6,177 deaths). Deaths by broad groups of causes in this age group were due to malignant neoplasms (397.8 per 100,000 population), diseases of the circulatory system (302.9), diseases of the digestive system (149.2), external causes (71.6), and endocrine diseases (66.7). With respect to hospital discharges for this age group, the leading causes were diseases of the digestive system (17.7%), diseases of the circulatory system (15.8%), malignant neoplasms (13.8%), diseases of the genitourinary system (10.5%), and diseases of the respiratory system (8.1%). The 2003 National Health Survey revealed that Chile was at an advanced stage in its epidemiological transition, highlighting elevated prevalence rates of smoking, of non-traumatic musculoskeletal symptoms, depressive symptoms in the previous year, and high rates of hypertension (Table 1).

The population with low levels of education is at greater risk for most chronic health problems, with the exception of smoking, which poses a greater risk to the more educated among the population. Chilean women have a higher prevalence for conditions that affect quality of life: tooth loss, musculoskeletal symptoms, obesity, impaired vision, and depressive symptoms. Chilean men, on the other hand, have an increased prevalence for determinants associated with cardiovascular risks, which is consistent with their higher mortality rates from this cause. The rural population has significantly higher rates of cognitive decline and tooth loss, which suggests some degree of disparity in access to basic education and health services. The urban population has significantly higher rates of depressive symptoms. There is a high degree of disparity by region in the prevalence of chronic health problems. Some 83% of adults suffering from multimorbidity (patients with two or more chronic diseases) are younger than 65 years old and 46% have less than eight years of formal schooling.

Among men and women 15 years old and older, 47.5% use some type of contraceptive to postpone pregnancy (either person or his/her partner): 16.7% use the intrauterine device or “IUD,” 15.6% use oral contraceptives, and 4.6% use condoms; 7.6% of Chilean women have been voluntarily sterilized. There are some differences by age. The age group 20–44 years old prefers oral

contraceptives (26.3%) and the IUD (25.8%), and to a much lesser degree, condoms (5.7%). In contrast, among persons 15–19 years old, 10.1% use condoms, 9.4% use oral contraceptives, and far fewer use the IUD (3.2%).

### Older Adults 65 Years Old and Older

The mortality rate for the age group 65–79 years old was 28.7 per 1,000 population, with 28,247 deaths, accounting for 33.8% of total deaths. The leading causes of death in this age group are diseases of the circulatory system (916.3 per 100,000 population), malignant neoplasms (866.4), diseases of the respiratory system (243.2), and diseases of the digestive system (238.0). With respect to hospital discharges for this age group, the leading causes were diseases of the circulatory system (18.6%), diseases of the digestive system (14.5%), diseases of the respiratory system (12.7%), malignant neoplasms (12.4%), and diseases of the genitourinary system (9.9%).

In 2003, the population 80 years old and older had a mortality rate of 116.8 per 1,000 population, accounting for 27,172 deaths or 32.5% of total deaths in 2003. The distribution of deaths per 100,000 population is as follows: diseases of the circulatory system (4,178.0); tumors (2,056.8); and diseases of the respiratory system (1,723.3). With respect to hospital discharges for this age group, the leading causes were diseases of the respiratory system (22.5%); diseases of the circulatory system (20.0%); diseases of the digestive system (10.6%); diseases of the genitourinary system (7.3%); and tumors (7.3%).

Chronic health problems are more prevalent among adults older than 60 years old, with the exception of depressive symptoms and smoking, which are lower in this group than in the general population older than 17 years old (4). Some degree of hearing loss affects 66.6% of men and 49.2% of women 60 years old and older. According to 2006 estimates based on the 2003 National Health Survey, 33% of older adults may need hearing aids. The prevalence of impaired long-distance visual acuity (with correction) is 34.5% for men and 44.2% for women aged 60 and older; 41.8% of men and 61.8% of women in this age group experienced tooth loss. Cognitive decline (confirmed by the Mini Mental State Examination and the Pfeffer questionnaire to detect senile dementia) was 8.5% for the population aged 60 and older. The prevalence of impaired visual acuity, tooth loss, and cognitive decline is higher among women, especially in rural areas. Some 7.8% of older adults have difficulty walking on flat surfaces. The prevalence of prostate-specific antigen levels higher than 4 ng/ml was 13.6% in males aged 60 and older.

### The Family

Between 1990 and 2003, approximately 720,000 women entered the job market, and account for 38% of the workforce. Some 60% of working women are in their childbearing years (under

**TABLE 1. Prevalence of certain chronic health conditions, rates per 100 adults, Chile, 2003.**

Health condition	Men	Women	Total
Arterial hypertension (SBP $\geq$ 140 or DBP $\geq$ 90 mmHg)	36.7	30.8	33.7
Dyslipidemias			
Total elevated cholesterol ( $>$ 200 mg/dl)	35.1	35.6	35.4
Low HDL ( $<$ 40 mg/dl)	48.4	30.6	39.3
Nutritional status			
Normal	36.6	36.9	36.9
Underweight (IMC $<$ 18.5)	0.6	1.1	0.8
Overweight (IMC 25 $<$ 30)	43.2	32.7	37.8
Obesity (IMC $>$ 30)	19.4	27.0	23.2
Morbid obesity (IMC $>$ 40)	0.2	2.3	1.3
Diabetes	6.1	6.5	6.3
Smoking (current smoker)	48.0	37.0	42.0
Metabolic syndrome	23.0	22.3	22.6
High global cardiovascular risk (ATPIII)	64.2	46.2	54.9
Symptoms of angina and high cardiovascular risk	11.7	13.8	12.8
Sedentary lifestyle	87.9	90.8	89.4
Musculoskeletal symptoms			
Symptoms over last 7 days, pain $\geq$ 4 (scale of 1–10)	26.1	42.2	34.3
Inability to work and disability among those with symptoms	2.4 <sup>a</sup>	5.1 <sup>a</sup>	4.0 <sup>a</sup>
Depressive symptoms (within the last year)	10.4	24.3	17.5
Renal function			
Elevated creatininemia (age-and-sex adjusted)	6.1	7.3	6.7
Diminished clearance 30–80 ml (body-surface adjusted)	19.4	22.4	21.0
Low clearance 30 ml	0.14	0.21	0.18
Chronic respiratory symptoms	22.2	21.3	21.7
Oral health problems			
Tooth loss in maxilla (0 teeth present in maxilla)	9.1	17.2	13.3
Tooth loss in both maxilla (0 teeth present in mouth)	3.2	7.7	5.5
Prevalence of dental caries	68.6	63.3	66.0
Vision (best eye, with correction, Snellen, normal 0.4–1)			
Loss of visual acuity (0.1–0.3)	7.9	14.2	11.2
Blindness ( $<$ 0.1)	1.9	3.2	2.6
Hearing loss			
“Whisper” and “tic toc” test findings	18.9	16.3	17.6
Gastric reflux (pyrosis or regurgitation of food)	26.5	33.1	29.9
Cognitive degeneration in older adults			
Cognitive decline + disability (MMSE $<$ 13 + Pfeffer $\geq$ 6)	8.3	8.6	8.5
Anemia (hemoglobin $\leq$ 12 mg%)	<sup>b</sup>	5.1	<sup>b</sup>
Elevated prostate-specific antigen $>$ 4 ng/ml	3.8	<sup>c</sup>	<sup>c</sup>

**Source:** Ministerio de Salud, Encuesta Nacional de Salud 2003.

<sup>a</sup>Symptomatic patients only.

<sup>b</sup>Women only.

<sup>c</sup>Men only.

age 40). The percentage of female heads of household increased from 25% in 1992 to 32% in 2002, as did the percentage of families where both spouses work (from 27% in 1990 to 39% in 2000). Extended families account for only about 10% of families. Traditional patterns in the division of household labor persist, causing women to become overburdened. On average, women typically work 41.5 hours per week, whereas men work 44.5. More than 30,000 children and adolescents living in female-headed households work to supplement the family's income. Of them, 2,000 are

between 5 and 8 years old. Approximately 42,000 girls and teen-aged females are responsible for caring for their siblings or offspring at the expense of their own development.

Among the country's health objectives slated for 2000–2010 is the need to implement a comprehensive program for the prevention and treatment of domestic violence, to include a component for the evaluating and monitoring of child abuse. To date, survey data indicate that more than 50% of women in depression treatment programs exhibit signs of domestic violence. Given the

estimated magnitude of this problem and the fact that it is currently underreported, a component to identify cases of domestic violence, child abuse, and sexual abuse was added to the data intake system at the primary health care level between 2002 and 2003. In 2004, domestic violence programs were implemented at 30 “communes” (*comunas*), which provided care to approximately 4,500 women for these problems. As a result, domestic violence care roughly doubled in 2005 compared with 2004.

### Workers

In 2004, there were at least 297 fatal accidents in the workplace, or 10.3 accident fatalities per 100,000 workers. Accidents en route to the workplace accounted for 28% of this figure. While this trend has been declining since 2000, when there were 14.12 accident fatalities per 100,000 workers, the distribution of fatal accidents by site of accident has remained the same. The rate of workplace accidents remained relatively stable between 2000 and 2004, ranging from 8.66% to 8.24%. The incidence rate for occupational diseases reported in 2004 was 0.15%, as compared to 0.10% in 2000. In 2004, an average of one workday per worker was lost due to workplace accidents, and .03 of a day per worker for occupational diseases. In 2004, there were 240,000 workplace accidents in companies enrolled in employers’ mutual insurance plans (Law No. 16,744).

Poisonings involving workplace pesticides are classified as workplace accidents. Since reporting became mandatory in 2004, the number of reported poisonings has doubled. There were 461 cases of workplace poisonings in 2005, or 63 per 100,000 workers. In 2005, the regions with the highest rates of workplace poisonings were the Santiago metropolitan region (148 cases per 100,000 population), region V (101 cases), and region VI (92 cases). These cases included many workers from the agricultural, hunting, and fishing sectors of the economy. Men were most affected (53%), averaging 33 years of age. Twenty-five cases of workplace poisoning were reported involving persons younger than 18 years old.

One of Chile’s health goals is to reduce morbidity and mortality associated with workplace conditions. Consequently, the country has developed an ongoing monitoring system to ensure that 100% of workplace accidents involving a fatality are investigated within 48 hours of the event. Coverage of inspection visits has been stepped up, from 8% in 2005 to 15% in 2006, with a view to preventing risks and ensuring adequate oversight of companies whose activities are considered high risk. Occupational health and safety teams and peer committees have received training to enhance their investigations into such accidents. Steps have also been taken to improve funding and the allocation of financial resources for the program.

### Persons with Disabilities

Conducted in 2004, Chile’s first national survey on disability (10) revealed that 12.9% of the population, or 2,068,072 persons, are living with some degree of disability. Adults are four times

more likely to have disabilities than children, while disabilities among older adults are 14 times more likely than among children. One of every two persons living with a disability had not completed basic education, and only one in three persons of working age with disabilities had a paying job. Of people with disabilities, 6% reported no access to rehabilitation services. One of every 40, or 403,842 persons, had a severe disability. There were 34.6% of households that had at least one member with a disability. Women account for 58% of persons with disabilities. The highest prevalence is observed among the age group 30–64 years old (51%). The most prevalent disabilities are physical (31.3%), followed by visual (19%). Some 10% of disabled persons have multiple disabilities. Chronic diseases are the leading cause of reported disabilities.

### Ethnic Groups

The country’s first sociodemographic and epidemiological study of indigenous groups was conducted in 1997 (11), revealing disparities between these groups and the rest of the country. For example, indigenous peoples had excessive infant mortality rates (more than 40 points higher than the national average in the case of the Atacameño population); lower life expectancy at birth (10 years less for the Aymará); a low Swaroop index, which is roughly equivalent to that of the country at the start of the 1980s; a pattern in the causes of death indicative of the situation prior to the epidemiological transition (Aymará); and worse health conditions among indigenous peoples living in cities than those of indigenous peoples living in rural areas. Subsequent studies have shown that the incidence of death from bronchial pneumonia among Mapuche children under 5 years old is higher than among children of non-Mapuche ancestry (12). Likewise, the incidence of tuberculosis is higher in areas with large concentrations of indigenous peoples. This is especially true of the Aymará, which, according to the Arica Health Service, have a tuberculosis mortality rate twice the national average. Studies show that both Mapuche children and adults tend to have short stature, and this difference is partly explained by their poverty and social vulnerability. The Araucanía (region IX), with its high concentration of Mapuche, has higher mortality from gallbladder cancer, as well as a high prevalence of coelitis and poor access to colonoscopy screening.

## HEALTH CONDITIONS AND PROBLEMS

### COMMUNICABLE DISEASES

All information in this section comes from the Ministry of Health’s Epidemiology Department (13).

### Vector-borne Diseases

In 2000, the **dengue** vector, *Aedes aegypti*, was detected on Easter Island, with household infestation indices on the order of 70%. In response, a vector control campaign was launched and a

## AUGE Plan: Basic Health Guarantees

The centerpiece of health care reform in Chile is the law that establishes the Plan for Universal Access with Explicit Guarantees (AUGE Plan, established by Law 19,966, known as the General System of Health Care Guarantees) and a law that strengthens the health authority and generates the conditions whereby hospitals can be managed with greater flexibility (Law 19,937 pertaining to the Health Authority and Network of Autonomous Hospitals). The AUGE Plan specifies four basic guarantees for a group of health problems: access, timeliness, quality, and financial protection. The AUGE Plan began to be implemented in the public sector in August 2002, with guarantees provided for three health problems. In 2003, two additional health problems were included, and by 2006, the 40 diseases that most affect family health and spending were being covered under the plan. The AUGE Plan implementation foresees including all 56 leading health problems by 2008. Guaranteed benefits include medications and medical inputs required to treat diseases. Benefits will be provided only at medical centers, hospitals, and clinics that comply with the Ministry of Health quality standards. Persons seeking care are ensured that they will receive treatment within an established time frame; if they do not, they can bring a complaint to the Office of the Health Superintendent.

dengue fever surveillance system put in place. In March 2002, the first case of indigenous dengue fever was confirmed on Easter Island, the index case of an epidemic outbreak that continued until mid-May. It affected 17% of the population, but did not result in any deaths. DEN-1 was the circulating serotype, which is phylogenetically identical to the strain that surfaced in Polynesia at the end of the previous year. No new outbreaks have been detected since. Continental Chile has remained free of the dengue vector.

In 1999, Chile achieved interruption of *Trypanosoma cruzi* transmission. The country's area of endemic **Chagas' disease** extends from regions I through IV, and includes the Santiago metropolitan region. Since 1992, the mortality rate for Chagas' disease (0.3 per 100,000 population) has stabilized at an average of 52 deaths annually. In 2001, the number of deaths jumped to 68 (0.44 per 100,000 population), but has been trending downward in the years since; 80% of these deaths are due to Chagas-related heart disease and the remainder to other visceral manifestations. Since 1996, the notification of infected blood donors has increased, for an annual average rate of 0.4 per 100,000 population (2003).

No cases of **yellow fever**, **plague**, or **schistosomiasis** have been reported in the country. Since 1945, there have been no reported cases of **indigenous malaria**. However, *Anopheles foci* are present in areas of the Yuta Valley (Arica) and Quebrada de Tarapacá (Iquique); region I has remained free of *Plasmodium* infection.

### Vaccine-preventable Diseases

Information in this section comes from the Ministry of Health's Expanded Program on Immunizations (14).

Vaccination coverage of infants younger than 12 months old with BCG, Hib, three doses of OPV, and three doses of DPT is over 95%, as is coverage with measles, mumps, and rubella triple vaccine at age 1 year old.

With regard to **poliomyelitis**, since 1975 the country has been free of wild poliovirus circulation. In 2001, coverage with three

doses of DPT/Hib vaccine was 96.6% and coverage with oral polio vaccine was 96.1%; in 2004, it was 95.1%. In 2005, reported cases of flaccid paralysis were 2.2 per 100,000 children younger than 15 years old, a figure similar to that in the 1990s.

Since the beginning of the 1990s, **diphtheria** evolved from being endemic to having sporadic cases, with the last case occurring in 1996. From 2002 to 2005, seven suspected cases of diphtheria were detected through surveillance activities, all of which were ruled out. Coverage with three doses of DPT in 2004 (15) was 93.1%.

Since 2004, there have been no confirmed cases of **measles**. Between 2001 and 2005, periodic vaccination campaigns of children under 5 years old were carried out to ensure that the country would hold on to the goal of eradication. In 2003, a case of imported measles was confirmed in a 33-year-old Chilean returning from Japan, in which the H1 virus was isolated. Vaccination coverage of 1-year-old children has remained over 90% for the last five years, reaching an all-time high of 94.4% in 2004.

Between 1996 and 2000, the rates of **pertussis** increased. This situation stabilized by 2001, reverting to a low endemic level (6.6 per 100,000 population in 2004), although the last weeks of 2005 witnessed an increase with respect to the previous 5-year period, for an annual rate of 7.7 per 100,000. In 2005, rates among adolescents and adults up to the age of 44 years increased with respect to previous years. The lethality rate for pertussis is approximately 0.2% to 0.4% (5–11 annual deaths). In 2003, the disease resulted in 11 deaths, 10 of which were diagnosed as "unspecified pertussis."

**Tetanus** cases have been sporadic, at between 7 and 10 cases annually over the past 11 years, and with incidence rates ranging between 0.04 and 0.12. In 2005, nine cases were reported for a rate of 0.06 per 100,000 population. No cases of **neonatal tetanus** have been reported since 1996. In Chile, children between 18 months and 4 years of age receive two DPT booster

doses; the diphtheria toxoid vaccine is administered during second grade.

In 2005, there were 1,607 cases of **mumps** reported, for an incidence rate of 9.96 per 100,000 population.

Due to an upsurge in the number of **rubella** cases in 1997, more than 70% of which affected persons between 10 and 28 years old, a rubella immunization campaign was carried out in August 1999. The campaign targeted females 10–29 years old, with a view to preventing congenital rubella syndrome (CRS), and achieved 99% coverage. As a result, the rate decreased from 31 per 100,000 population in 1998 to 11 per 100,000 in 1999, and there was a drop in the incidence rate to only 1.9 in 2002 (94% decrease). Most cases of rubella (68%) occurred in children under 5 years old. In 2003, there were 128 confirmed cases, for a rate of 0.8 per 100,000 population, which represented a 58% decrease with respect to 2002, and a 97% decrease as compared to the year when rubella was at epidemic levels (1998). In 2004, a number of isolated cases were confirmed. In 2005, the first post-immunization campaign outbreak occurred at a military installation in region V, where 46 young men were infected. As of June 2005, there have been no other confirmed rubella cases in the country. In September 1999, a CRS surveillance system was launched. Between 1999 and 2000, 18 CRS cases were detected, 14 of which presented birth defects at the time of the examination. From 2001 to 2005, there were no new confirmed CRS cases.

In 1996, surveillance of invasive infections associated with ***Haemophilus influenzae* type b** (Hib) was launched, targeting children between the ages of 2 months and 5 years. That same year, a program of free vaccination against the disease was implemented, following which reported cases decreased from 10.6 per 100,000 children under 5 years old in 1996, leveling off at approximately 2.0 per 100,000 over the last five-year period. In 2005, 19 cases of Hib infection were confirmed among the targeted age group, 58% of which affected males. The age range was 2 months to 3 years of age, with a median age of 1 year.

**Influenza** epidemics occur every three to four years. In 2004, the number of cases more than doubled compared with the figure for the same period in 2003 (5,143 cases), which qualified the outbreak as an epidemic. The cumulative rate in 2005 was 633 cases per 100,000 population, which was down from the figure seen for the same date in 2004. Rate increases were observed for all age groups between 2003 and 2004. Moreover, the difference between those two years was significantly less among the population 65 years old and older (37%), which may be attributable to vaccination efforts that targeted this age group. Over the past decade, variations in the mortality rate from influenza have been observed every three years, associated with outbreaks. In 2001, 82% of deaths attributable to this cause (56 deaths; rate of 0.4 per 100,000 population) occurred in people 65 years old and older (4.1 per 100,000 population). In 2002 and 2003, a drop in mortality from this cause was observed (16 and 19 deaths, respectively), including in persons 65 years old and older (2003 rate of

1.6 per 100,000 population). In 2001 (year in which influenza was epidemic), a higher mortality rate from pneumonia was observed among people 65 years old and older, which subsequently decreased. In 2005, vaccination coverage for influenza was 94.6% for chronically ill adults 65 years old and older, 93.7% for pregnant women, and 95.1% for health workers.

### Intestinal Infectious Diseases

**Typhoid fever** and **paratyphoid fever** are endemic diseases that tend to be seasonal in nature (March, October, and November). These diseases have been at low endemic levels since 1984. They occur as localized outbreaks in schools or daycare centers and are linked to the consumption of bacteria-contaminated food and water. Incidence rates for 2004 and 2005 were similar (4 per 100,000 population), with 488 cases reported in 2005. The groups at greatest risk are males and females 5–19 years old; the regions at greatest risk are II, X, VIII, and VI.

**Hepatitis A** is a disease of intermediate endemicity with epidemic outbreaks every four to five years, mainly in institutions. The most recent epidemic cycle began in 2002 (2001 in some regions) and remained within expected levels during 2004. In 2005, there was a 62.4% drop in cases as compared to the previous year, and cases were 57% lower than expected for a non-epidemic year, for a cumulative incidence rate of 14.4 per 100,000 population. Weekly incidence rates for 2005, which were on the order of 0.3 cases per 100,000 population, remained lower than those observed in 2003 and 2004. The age group 5–14 years old accounts for 40% of the cases. Moreover, a significant increase in the disease has been observed among adolescents and young adults 15–24 years old, affecting more men than women. The disease is distributed throughout the country. The Tarapacá region has the highest incidence rate, at 81 per 100,000 population, followed by the Antofagasta and Coquimbo regions.

Since 1998, there have been no new cases of **cholera**. Deaths of children under 5 years old associated with diarrheal diseases have dropped significantly, from 3.8 per 100,000 children in 1990 to 0.6 in 2003. Due to the cholera epidemic, epidemiological surveillance of **acute diarrheal diseases** was stepped up and mandatory reporting of all diarrheal diseases with dehydration was instituted. Since 2003, data on morbidity and its causes have been available from a network of sentinel centers. During 2005, a total of 8,672 cases of diarrhea in children under 5 years old were reported, for a rate of 9 per 1,000 children. Diarrhea in this age group occurs seasonally, typically in summer (weeks 1 through 16). Infants under 1 year old are most at risk for developing diarrhea, for a rate of 89 per 1,000 children. Rates for most regions range between 6 per 1,000 children under 5 years old to 9 per 1,000. In 2004, surveillance of **rotavirus infection** began at 13 selected diarrheal sentinel centers, following the detection of rotavirus in December 2005 in 14.8% of samples analyzed. The Coquimbo region had the highest percentage of positive samples (21%), whereas the Antofagasta region had the lowest (8.3%).

The virus affects men (14%) and women (13%) in similar proportions, and the highest number of samples are in children under 12 months old (32%).

### Chronic Communicable Diseases

Morbidity from **tuberculosis** was similar in 2001 and 2004 (18.4 per 100,000 population). During those years, activities of the national program of tuberculosis prevention and control have been ongoing: bacilloscopy to evaluate suspected cases and monitor treatment, cultures for diagnosing and monitoring the disease, and implementation of the Direct Observed Therapy Short Course (DOTS) strategy for all forms of tuberculosis in the country. In 2004, these activities paved the way for 11 million Chileans to enter the elimination phase of the disease (rate lower than 20 per 100,000 population).

### HIV/AIDS and Other Sexually Transmitted Infections

Since the first AIDS case was reported in 1984 up to 31 December 2004, a total of 13,728 cases had been reported in the country, 6,509 of which have been classified as symptomatic AIDS and the remaining 7,219 as HIV positive, asymptomatic individuals. The cumulative HIV/AIDS incidence rate is 98.1 per 100,000 population. The national incidence rate of reported HIV/AIDS cases in 2004 was 7.18 per 100,000 population (12 in men and 2.44 in women). The majority of cumulative cases affect men (85.2% of cases). The male-to-female ratio for 1999–2003 was approximately 5:1, and the cumulative rate for 1984–2004 was 5.7. Most affected are persons 15–49 years old, who account for 90% of cases. The highest cumulative incidence rates for 1984–2004 by region are the Santiago metropolitan region (152.2 cases per 100,000 population), Tarapacá (137.1), and Valparaíso (129.6). The main form of transmission is sexual contact (86.1%), 56.4% through homosexual or bisexual relations. The first AIDS deaths in Chile occurred in 1984. To date there have been 4,644 deaths: 4,086 men (88%) and 558 women (12%). The accumulated mortality rate for 1984–2003 was 33.4 deaths per 100,000 population. Since 1998, AIDS mortality has been unstable but increasing, reaching its highest point in 2001 (3.5 per 100,000 population). The 2003 rate (last official year) was 2.7 AIDS deaths per 100,000 population. In 2003, the rate for men was 4.5 per 100,000 population and for women, 0.8. The age group 25–44 years old accounts for 68% of deaths. Between 1993 and 1997, AZT was the treatment of choice, but beginning in 1998, combination therapy with antiretroviral drugs began to be used. Beginning then and up to 2005, vertical transmission of the disease was reduced from 30% to 1.8%.

Mandatory notification is required for both **syphilis** and **gonorrhoea**. The syphilis incidence rate was 23.9 per 100,000 population in 2000 and 17.4 (2,831 cases) in 2005, although underreporting of the disease is probable. Women accounted for the majority of reported cases in 2005 (52.9%). In 2005, 276 cases were reported in pregnant women and 44 cases of congenital

syphilis also were reported, which remained within the median for the period 2000–2005. In 2005, the highest rates were observed in the Aisén del General Carlos Ibáñez del Campo and Antofagasta regions, which had rates four and two times the national average, respectively. The gonorrhoea incidence rate was 16.1 per 100,000 in 2000 and 10.7 in 2005 (1,739 cases), with men accounting for 77.2% of reported cases. The most reported cases occurred in the Tarapacá region, which were in excess of seven times the national rate, followed by the Los Lagos and Aisén del General Carlos Ibáñez del Campo regions, with more than three times the national rate.

**Hepatitis B** surveillance is universal, with daily case-by-case and clinical laboratory notification. The 2003 National Health Survey found the prevalence rate of hepatitis B surface antigen carriers to be 0.1% among the population older than 17 years old. Currently, high-risk groups—health workers and chronic hemodialysis patients—are vaccinated. Discussions are under way concerning the possibility of including this vaccine as part of the childhood immunization schedule.

According to the 2003 National Health Survey, 15% of sexually active women are carriers of the **human papillomavirus** (a self-administered vaginal test kit had been distributed to test for the virus). The highest prevalence is seen in women younger than 35 years old (over 23%).

### Zoonoses

**Hydatidosis** is endemic in Chile, especially in rural areas where sheep are raised. Mortality from hydatidosis has remained stable over time, and is the second leading cause of death from parasitic infections after Chagas' disease, with 30 to 40 deaths seen each year. The hydatidosis mortality rate was 0.2 per 100,000 population in 2003, and remained unchanged between 2001 and 2002. Reported cases of hydatidosis have held steady since 1989, at approximately 2–2.5 per 100,000 population. In 2005, 345 cases were reported, or 2.14 per 100,000 population. Despite the high figure and the fact that notification of the disease is mandatory there is significant underreporting, as evidenced in hospital discharge records. Accordingly, 1,220 patients were discharged due to hydatidosis in 2003, but only 337 cases were reported that year. Consequently, hydatidosis was the leading cause of hospitalization due to parasitic diseases that year. Hospital admissions vary greatly by region, with the highest rates observed in the country's rural areas. The Aisén del General Carlos Ibáñez del Campo region (XI) had the highest hospitalization rate, with 41 discharges per 100,000 population, followed by region IX with 38 discharges.

**Anthrax** outbreaks occur sporadically in Chile. During 2004, there was an increase in outbreaks compared with previous years (incidence rate of 0.07 per 100,000 population); but no cases were reported in 2005. There are also sporadic outbreaks of **brucellosis**. Nine cases were reported in 2005, originating in region X and the Santiago metropolitan region, but no brucellosis

deaths were reported. **Trichinosis** emerges in sporadic outbreaks among family groups, with incidence rates that range between 0.7 and 0.2 per 100,000 population. There are between 0 and 2 deaths from trichinosis each year. During 2005, 55 cases were reported, for an incidence rate of 0.4 per 100,000 population. All outbreaks were attributable to unlicensed slaughter facilities.

## NONCOMMUNICABLE DISEASES

### Metabolic and Nutritional Diseases

Nutritional diseases due to insufficient caloric intake have declined dramatically, while nutritional problems associated with overeating have been on the rise. In 2003, some 5.6% of newborns weighed less than 2,500 g and 1% weighed less than 1,500 g. In 2004, the prevalence of underweight pregnant women as a percentage of all those monitored in the public health care system was only 12.2%, whereas obesity prevalence reached 32.2%. This figure remained unchanged in 2000–2004, although it was higher than its 1994 level of 26.4%. Malnutrition rates among children under 6 years old who are monitored at the primary health care level have decreased, while the prevalence of obesity in the group has increased, although obesity figures have been stabilizing in the reporting period. The prevalence of underweight (BMI < 18.5) in adults is 0.3%, while the prevalence of obesity is 23.2% (19.6% in men and 29.3% in women). More than 60% of the population is either overweight or obese, and 1.3% is morbidly obese (BMI  $\geq$  40). The highest rates of obesity in adults were observed in women of low socioeconomic status. Obesity among people with less than eight years of schooling is 33.4%. Approximately 29.5% of adults have central or visceral obesity (increasing waist circumference), which jumps to 44.3% among the population with a low level of education. Obesity rates are highest among the lower socioeconomic strata and in the country's deep south (Magallanes region).

The estimated prevalence of **diabetes** among males 60 years old and older is 22.7%; it is 18.6% for females in this age group. The prevalence of diabetes is significantly higher among the population with less than eight years of schooling. Age-adjusted mortality rates for diabetes are increasing. In 2003, diabetes claimed the lives of 3,278 persons, for a rate of 20.6 deaths per 100,000 population.

Among the general population, nonpregnant women older than 17 years old have a 5.1% prevalence of anemia (< 12 g/dl). Exclusive breast-feeding through the fifth month after childbirth in the population accessing the primary health care level in the public services increased from 16% in 1993 to 39.5% in 2000; it was 43.1% in 2002.

### Cardiovascular Diseases

Mortality from **ischemic diseases** declined from 53.8 per 100,000 population to 50.9 in 1998–2003. Over the same period, mortality from **cerebrovascular diseases** held steady at 50.1 per

100,000 population. According to estimates, a decrease in age-adjusted mortality from ischemic and cerebrovascular diseases is expected, as is an increase in mortality from hypertension. The rate of hospital discharges owing to ischemic heart disease is 127.9 per 100,000 population and that due to cerebrovascular diseases is 124.7 per 100,000 population.

**Hypertension** rates among the adult population are high (33.7% of screening tests are positive), especially among young men. The real prevalence of hypertension is estimated at approximately 26% (after diagnostic confirmation). According to the 2003 National Health Survey, hypertension detection, treatment, and control rates are 59.8%, 36.3%, and 11.8%, respectively, and rates are higher among women. Some 12.8% of adults who complain of effort-related chest pain also have more than two cardiovascular risk factors, diabetes, or a preexisting cardiovascular disease. The prevalence of **high total cholesterol** (> 200 mg%) or low HDL cholesterol (< 40 mg%) is 63% among adults older than 17 years old. The most prevalent type of dyslipidemia is low HDL (39.3%). Metabolic syndrome affects 28% of adults (ATPIII).

More than half of adults have two or more of the five risk factors for cardiovascular disease: smoking, age, positive family history for the disease, HDL < 40 mg/dl, and hypertension. Some 6.6% of adults older than 17 years old are at extreme risk for developing cardiovascular disease based on an evaluation of risk factors (smoking, sex, age, systolic pressure, HDL, and total cholesterol). Consequently, according to the Framingham study probability (without considering diabetes), this group's risk for developing a coronary heart disease event over a 10-year period is greater than 20%. Based on the ATPIII classification, which considers risk factors such as diabetes or equivalent cardiovascular conditions, 13% of the population would be at extreme risk. With regard to the determinants of cardiovascular risk, 89.4% of the general population has sedentary lifestyles, increasing to 95.4% among the population with less than eight years of schooling. In the age group 24–44 years old, 29% smoke, are either overweight or obese, and lead sedentary lifestyles simultaneously.

### Malignant Neoplasms

Malignant neoplasms are responsible for 23% of total annual deaths and are the second leading cause of death, following diseases of the circulatory system. In 2003, malignant neoplasms claimed the lives of 20,123 Chileans of both sexes, for a rate of 123.7 per 100,000 population. According to estimates, each year malignant neoplasms are responsible for 96,000 hospital discharges and there are 30,000 new cases diagnosed. In 2003, there were 3,115 deaths from malignant neoplasms of the stomach (19.6 per 100,000 population) and 2,016 from malignant neoplasms of the lung (12.7 per 100,000 population). Among men, the leading sites for cancer deaths are the stomach (26.1 per 100,000 population), prostate (18.7 per 100,000 population), and lungs (16.6 per 100,000 population). Among women, the leading sites for cancer are the gallbladder (17.6 per 100,000 population),

breast (13.3 per 100,000 population), and stomach (13.1 per 100,000 population).

In the 16 years since the national pediatric cancer program has been in operation, it has proven its effectiveness in improving survival rates and reducing the lethality of most pediatric cancers. In 2000–2002, mortality decreased 26.4%. Acute leukemias have declined by 35.5% and lymphatic leukemias, by 44.1%. Hodgkin's disease has declined by 70.5%, and cohorts treated since 1999 have a 73.2% complete remission rate, a 5-year survival rate of 87%, and a total survival rate of 98%. Malignant neoplasms of the central nervous system in children account for 17% of pediatric cancers in the public health sector, and a reporting system has been in place since 1997.

Age-adjusted mortality for cancer of the cervix between 1999 and 2003 was reduced by 40%. Rates among the early detection program's target group (people over age 25) decreased from 17 per 100,000 population in 1999 to 14.4 per 100,000 in 2003.

The prevalence of prostate-specific antigen at levels above 4 ng/ml is 3.8% in men over 35 years old. Since 2000, coverage of the palliative care program has increased, which treated 13,900 patients in 2004.

### Musculoskeletal Conditions

In 2003, the prevalence of musculoskeletal symptoms of non-traumatic origin was 34.3% among the population over 17 years old. Prevalence rates are significantly higher among the elderly, women, and groups of low socioeconomic status. The most prevalent complaint site is the knees, followed by the lumbar region, ankles, and hands. Of the population with musculoskeletal symptoms, 64% retains normal functionality; only 4.2% has a disability or handicap. Most cases follow a chronic course, and only a small percentage has received a specific medical diagnosis. The estimated prevalence of rheumatoid arthritis is approximately 1%. No other demographic studies carried out in the last 5-year period have provided statistical data on the prevalence of specific causes. Musculoskeletal diseases represent an important co-morbidity of chronic adult diseases; according to 2003 estimates, approximately 7% of adults over the age of 17 years presented co-morbidities of dyslipidemia, hypertension, and chronic musculoskeletal symptoms.

## OTHER DISEASES AND HEALTH PROBLEMS

### Disasters

Chile suffered 19 natural disasters in 2000–2005. Earthquakes caused 11 deaths, 182 injuries, and affected the lives of another 27,463. Although the country is located in a high-risk zone for earthquakes (more than 10 million inhabitants exposed), it has an average vulnerability of 1 to 10 deaths per 1 million population exposed. Extreme temperatures have affected 25,000 persons during the period. Floods claimed the lives of 47 Chileans

and affected 40,886, per year, on average; 221,842 persons were affected between May and June 2002. The floods of June 2000 and of May–June 2002 are among the 10 disasters that affected the most people between 1996 and 2005.

### Violence and Other External Causes

Since 1995, accidents have ranked as either the third or the fourth leading cause of death. In 2003, 9% of deaths were due to this cause, for a mortality rate of 46.5 per 100,000 population, which represents a 7.7% decline with respect to 1999. The average excess mortality for men is 4.3 times that of women, although excess mortality is observed in all age groups, in all parts of the country, and for all the different types of accidents, with the exception of falls. The regions with the lowest and highest rates are Atacama and Aisén del General Carlos Ibáñez del Campo, respectively. The Santiago metropolitan region has rates lower than the national average and rates seem to be decreasing. Mortality from trauma and poisonings primarily affects adults 20 years old and older. During 2003, 31% of external deaths among men were due to traffic accidents and 23.5%, to self-inflicted injuries. Among women, 29% were due to traffic accidents and 21%, to falls. In 2003, trauma events, poisonings, and other external causes accounted for 10% of hospital discharges and were the fourth leading cause of hospitalization, representing the leading cause of hospitalization for men, with 17% of cases (102,718 discharges), and the sixth leading cause for women, with 6% of cases (54,652 discharges).

### Mental Health

Although awareness about the significance of mental health problems has been on the rise since the 1990s, no specific studies have explored the situation in detail over the last 5-year period. The prevalence of **depressive disorders** among the population ranged between 13% and 17% during the reporting period. In 2004, a national program to diagnose and treat depression served 103,166 patients at the primary health care level and 7,500 patients at the specialized level. The annual incidence of **schizophrenia** among the population older than 15 years old is 12 per 100,000 population. Between 2000 and 2003, the age-adjusted suicide rate increased from 9.7 to 10.4 per 100,000 population. Depression is a significant problem; however, the combination of anxiety and consumption disorders (including alcohol abuse) carried more relative weight in studies conducted in the 1990s.

### Addictions

Consistent with the findings of the 2003 National Health Survey and 2000 National Quality of Life and Health Survey, the National Drug Control Council (CONACE) affirms that **smoking** prevalence rates in 2000–2004 stabilized, at 42% (16). However, as is the case in the school-aged population, more and more women are taking up smoking, especially those of childbearing

age (19–34 years old). In 2004, 55% of women 19–25 years old were smokers.

Due to its link to mortality from cirrhosis, accidents, and violence, **alcohol consumption** is an extremely important if often dismissed topic. According to the above-mentioned National Quality of Life and Health Survey, 15% of adults were problem drinkers in 2002, with the highest prevalence among men, the rural population, and persons with a low level of education. Alcohol consumption among the general population exceeds 50% at all income levels, according to statements of respondents about their alcohol consumption in the 30 days before the survey (2004). Alcohol consumption rises with family income; however, the most significant problems and cases of alcohol-related dependency are seen among the population at the lowest levels of income. Household surveys conducted by CONACE since 1994 show a sustained increase in illegal drug use through 2000 (in annual consumption rates, as well as in consumption in the last year and the last month before the survey). This trend stabilized in 2000–2004.

### Oral Health

During the reporting period, there have been no national-level epidemiological studies to provide a comprehensive assessment of the country's oral health situation. In a partial study to determine the effectiveness of eight years (1996–2004) of water fluoridation in the Santiago metropolitan region, which targeted the population between the ages of 6 and 8 years and 12-year-olds, it was observed that the number of permanent teeth damaged by caries in children 6–8 years old decreased 49.6% (decayed, missing, and filled teeth index, or DMFT, decreased from 1.17 teeth to 0.59 teeth). In children 12 years old, this indicator dropped by 16.9% (DMFT 3.13 teeth to DMFT 2.60 teeth) (17). The 2003 National Health Survey revealed that 66% of adults older than 17 years old had dental caries and that 13.3% had lost one or both molars. In adults, the prevalence of total tooth loss is 5.5%, which increases to 33.4% among adults over 65 years old, and is highest among women, the rural population, and people with less than eight years of schooling. Tooth loss prevalence rates are lowest in the country's northern portion and highest in the south, which is consistent with the natural fluoride content in water. According to estimates, coverage of the population with fluoridated water was 70.5% in 2004.

### Meningococcal Disease

Since 2001, the disease began to decline toward low endemicity (rates of 2.7 and lower), until reaching an incidence of 1.5 per 100,000 population in 2005 (235 cases). The greatest risk of infection, which is slightly higher for men, is found in the Santiago metropolitan region. Mortality has remained stable, with rates between 0.2 per 100,000 population and 0.3, decreasing to 0.1 over the last two years. The lethality rate, which reached 11.2% in 1990, dropped to 5.5% in 2005. During 2005, a change was ob-

served, as meningitides decreased by 34% and meningococemias increased by 45%. Children under 5 years old accounted for half of all cases. Of the 121 confirmed cases in 2005, 84% were serogroup B strains; 6%, C strains; and 9% ,Y and W-135 strains.

### Hantavirus Cardiopulmonary Syndrome

The etiological agent identified in Chile is the Andes virus, whose only confirmed reservoir to date is *Oligoryzomys longicaudatus*. Since the first sporadic cases were detected in 1995, the disease has become endemic, with seasonal outbreaks (70% between November and April) focalized in several areas of the country. From 1995 through December 2005, there were 461 confirmed cases of hantavirus cardiopulmonary syndrome (HCPS). The highest incidence occurred in 2001, but has stabilized subsequently. In 2005, incidence reached 0.42 per 100,000 population. The HCPS lethality rate declined from 60% in 1997 to 31% in 2005 (20 deaths). Its lethality rate is higher among women (37%) than men (27%). The mortality rate has remained stable during the past three years, ranging between 0.11 and 0.13 deaths per 100,000 population. During 2005, there were 67 confirmed cases of HCPS and 7 mild cases (without respiratory failure), which was higher than expected. HCPS cases are observed from the Valparaíso to the Aisén del General Carlos Ibáñez del Campo regions. The greatest risk of infection, however, is found in the latter region, where the incidence rate has reached 3 per 100,000 population. Moreover, the greatest number of cases was observed in region VIII (20 cases). The reservoir of the Andes virus is widely distributed, and the virus has been found in rodents from regions IV to XI.

## RESPONSE OF THE HEALTH SECTOR

### Health Policies and Plans

Current health sector reforms were officially set in motion by a set of draft laws that the former Administration (2000–2006) submitted to the Parliament in 2002. At the core of the reforms are two laws: Law No. 19,966, known as the General System of Health Care Guarantees, which established the Universal Access Plan with Explicit Guarantees, or "AUGE" Plan, and Law No. 19,937 on Health Authority and Network of Autonomous Hospitals, which strengthens the health authority and establishes conditions for greater flexibility in managing hospitals. The proposal for reforms also considered two draft laws, one to modify private health insurance providers (ISAPREs) and another to finance such changes.

The AUGE Plan specifies the following four basic guarantees for 56 health problems (see Box 1 for a list): access, timeliness, quality, and financial protection. Law No. 19,937, which entered into force on 1 January 2005, split the former Under Secretariat of Health into two under secretariats: the Under Secretariat of Public Health and the Under Secretariat of Health Care Networks. It

also reorganized the former ISAPREs Oversight Office into the Office of the Health Superintendent, which is responsible for overseeing ISAPREs, the National Health Fund (FONASA), and public and private health care providers. Execution of the AUGE Plan began gradually and is expected to be finalized for all health problems covered under the plan by 2008.

The health policy framework and plans slated for the current Administration's term (2006–2010) call for completing the implementation and strengthening of the aforementioned reforms. Specifically, this includes increasing the number of covered health problems under the AUGE Plan from 56 to 80 by 2010; strengthening institutional reforms aimed at separating out the delivery of health care services from oversight functions, as well as the implementation of the system of autonomous hospital network; strengthening the family-oriented focus of primary care; enhancing private health care by introducing more competition into the ISAPRE market and streamlining its health plans; and laying the foundations for an elder care policy (18). Looking forward to 2010, the health objectives are reducing disparities in health, addressing the new challenges associated with the aging of the population and the society's changing demographics, and providing quality health care according to the population's needs and expectations.

Chile's health care system is governed by regulations issued by the Ministry of Health, whose programs determine coverage levels, the frequency of contact between users and care providers, and the responsibilities inherent at each level of care in the health system. These regulations constitute mandatory frameworks for care at public and private health establishments, in agreement with the public sector, and represent a frame of reference for the organization of private-sector health care establishments.

Before the changes introduced by Law No. 19,937 (Health Authority Law), the public and private sectors were regulated by health service bureaus, working through the offices of medical and paramedical professionals located in their respective territorial jurisdictions. Beginning 1 January 2005, this responsibility and the technical offices themselves were transferred to the Ministry of Health's Regional Secretariats (SEREMIs) in each region, thereby strengthening them.

### Organization of the Health System

The Ministry of Health is the lead agency in the sector. It formulates and establishes health policies and issues general standards and plans, as well as supervising, monitoring, and evaluating compliance with them. The Health Services, the National

#### BOX 1. Health problems covered under Chile's AUGE Plan.

1. Delivery care with analgesia
2. All childhood cancers
3. Cervicouterine cancer
4. Breast cancer
5. Leukemia (adults)
6. Lymphoma (adults)
7. Testicular cancer
8. Prostate cancer
9. Stomach cancer
10. Gallbladder and bile duct cancer
11. Terminal cancers (palliative care)
12. Ischemic disease (myocardial infarction)
13. Behavioral disorders
14. Congenital heart disease (operable)
15. Neural tube defects
16. Cleft lip/palate
17. Chronic renal insufficiency
18. HIV/AIDS
19. Cataracts
20. Major burns
21. Polytrauma patients with or without medullary lesion
22. Hernia of the nucleus pulposus
23. SNC tumors and cysts
24. Aneurisms
25. Diabetic retinopathy
26. Refractive errors
27. Tooth loss in older adults
28. Surgery requiring prosthesis
29. Hypoacusis
30. Benign hypertrophy of the prostate
31. Pneumonias in older adults
32. Orthotics for older adults (canes, wheelchairs, others)
33. Hemophilia
34. Cystic fibrosis
35. Scoliosis
36. Depression
37. Alcohol/drug dependency
38. Psychosis (severe psychiatric disorders)
39. Bronchial asthma
40. Chronic obstructive pulmonary disease (COPD)
41. Arterial hypertension
42. Encephalitic vascular accident
43. Diabetes mellitus, types I and II
44. Prematurity
45. Retinopathy of prematurity
46. Difficult breathing of newborn
47. Accidents requiring CPU care
48. Rheumatoid arthritis
49. Degenerative osteoarthritis
50. Epilepsy (program to improve management in children)
51. Eye trauma
52. Detached retina
53. Strabismus (children under 9 years)
54. Acute respiratory infections (children under 15 years old)
55. Comprehensive oral health
56. Dental emergencies

Source: Ministry of Health.

Health Fund (FONASA), ISAPRE's Office of the Health Superintendent, the Public Health Institute (ISP), and the Central Supply Clearinghouse (CENABAST) report to the Ministry. According to the most recent legislative changes to the health reforms, Law No. 19,937 delegates responsibility for managing the health care network to the 29 health service bureaus, having transferred health authority functions to the Ministry of Health's Regional Secretariats in each of the 13 regions of the country. The Public Health Institute is responsible for regulating drugs and medical inputs.

In Chile health services are a mixed system in terms of financing, health insurance, and service delivery. By law, all workers are required to pay 7% of their monthly wages into public (FONASA) or private (ISAPREs) health insurance. In addition to contributions from its members, FONASA receives transfers from the Government's Department of the Treasury to cover indigents and to carry out public health programs. The private insurance sector is represented by the ISAPREs, private health insurers that administer the obligatory contributions from wage earners; their members can pay additional premiums to improve their insurance-plan coverage. The ISAPREs and FONASA are both overseen by the Office of the Health Superintendent. Implementation of the AUGE Plan has consolidated this authority. There are also employers' mutual insurance plans that specifically administer insurance for on-the-job accidents and occupational diseases and whose financing is under the responsibility of the employers. Although FONASA and the Office of the Health Superintendent are autonomous, they are subject to oversight by the Ministry of Health, which bears responsibility for sector policy. The Public Health Institute controls drugs and medical inputs and acts as the national reference laboratory. CENABAST procures products for the public sector.

The delivery of services also is mixed. The vast majority of primary care facilities are administered by the municipalities; hospitals fall under the responsibility of the Health Services. Law No. 19,937 provides for a network of autonomous hospitals, which permits greater flexibility in the management of the country's 56 highly complex hospitals. In 2005, autonomy authorization was granted to five hospitals; by 2009, all 56 of the country's highly complex hospitals will be granted this authorization. In addition, there are a series of clinics, centers, laboratories, and pharmacies that are managed by private individuals or companies. There are only a few not-for-profit nongovernmental organizations, and their work is limited to some rural health centers and hospitals operated by religious organizations.

FONASA covers 68.3% of the population and the ISAPREs 17.6%. The remaining 14.1% is covered by other private plans (such as the armed forces plan) or has no insurance at all (19).

ISAPREs can be restricted or open. In restricted institutions, membership is limited to individuals working in a given company or sector of the economy, such as large public copper mining companies. Open institutions allow anyone to become a member. Most ISAPREs (15 nationwide) work through private

providers, but may also enter into agreements with public health institutions for some services (e.g., hospitalization in private wings of certain hospitals, emergency care, and care in intensive care units). Some ISAPREs have their own networks to provide care for their subscribers, a trend that has been increasing as the AUGE Plan has been progressively implemented. The insurance contract is negotiated individually between the ISAPRE insurer and the contributor, who is required to make a co-payment, the amount of which varies considerably. ISAPREs may not offer health insurance plans with fewer benefits than FONASA offers, however. The guaranteed financial protection specified under the AUGE Plan sets the maximum co-payment amounts for FONASA and ISAPRE beneficiaries (guaranteed financial protection) for the list of covered health conditions.

Public health services must meet all demands for emergency services. Moreover, the public health programs (such as immunization and tuberculosis control) target the entire population, without discrimination. Peak coverage under ISAPREs was reached in 1995, with coverage of 26.3%. Since 1997, there has been a migration of subscribers from ISAPREs to FONASA, which is attributed to the effects of the Asian financial crisis at the end of the 1990s, to improved public health services, and to the recent implementation of the AUGE Plan (20).

FONASA is responsible for supervision and control of public health sector financing. As is true for all public sector institutions, the Office of the Controller General has ultimate control over its management.

### Public Health Services

The Ministry of Health's basic programs (targeted to children, women, adults, and oral health) and their respective subprograms have been designed to take a comprehensive approach, including promotion, prevention, treatment, and rehabilitation. The Ministry of Health has established specific prevention programs, including immunization, food supplements, control of respiratory diseases, prevention of traffic accidents, control of the toxic algal bloom known as "Red Tide," and eradication of Chagas' disease. By December 2004, coverage of the cervical cancer screening program (Pap smears in women aged 25–64 years) was 68%, and 67% for the group at greatest risk (ages 35–64). Coverage of the breast cancer prevention program reached 54% in 2003. These two screening programs will be further enhanced when cervical and breast cancer are added to the health conditions covered under the AUGE Plan.

The Public Health Institute carries out epidemiological surveillance in cooperation with the Ministry of Health's Epidemiology Department. Through the National Control Department, the Public Health Institute monitors the national system for the control of pharmaceutical products, food, cosmetics, pesticides for public health and domestic use, and medical articles. The Institute also acts as the national reference center and is the body that

certifies clinical laboratories and blood banks nationwide. Thus, the Institute provides support for ministerial programs designed to control communicable diseases and monitor the quality of pesticides, clinical laboratories, and blood banks. Vital statistics (birth and death certificates) are the most reliable element in the information system. Their coverage is approximately 99%. The system for surveillance of communicable diseases is universal.

With regard to the prevention and control of air pollution, the health sector is responsible for overseeing the elimination or control of all environmental factors, elements, or agents that can harm the health, safety, and well-being of Chileans. There are programs in basic sanitation, air pollution, hazardous chemicals, hazardous waste and liquid industrial waste, food hygiene, vectors of health importance, zoonoses, microbial and parasitic diseases, environmental impact assessment, occupational health, public places, and environmental emergencies. Health reforms transferred control of the environmental departments under the Health Services to the Ministry of Health's Regional Secretariats (SEREMIs) in each region, as was the Environmental Health Service in the Santiago metropolitan region. Consequently, the SEREMIs are now responsible for prevention, control, inspection, and oversight activities in the environmental sphere. Environmental testing is conducted by 20 laboratories that operate in coordination with the Public Health Institute, which acts as the national reference laboratory in microbiology, food science, environmental pollution, and occupational health.

Program guidelines on environmental quality are geared toward controlling the population's health risks due to airborne pollutants. The health authority develops air quality surveillance programs by monitoring compliance with current air quality standards and performs ongoing inspections of airborne pollutants released in emissions of high- and medium-complexity facilities, according to the risks associated with such emissions. Regular diagnosis involves an inventory of fixed sources and fuels used by fixed sources and estimates of emissions from fixed sources, monitoring stations, contaminants measured, measurements on specific dates of the year, and the population affected. The National Environment Commission (CONAMA), under the Ministry of the Interior, is an intersectoral agency and the country's steering authority on environmental matters. The Regional Environmental Commissions (COREMA) are the lead agencies in each region.

Food safety and control systems are based on the Health Code. Food Health Regulations, which establish specifications for food products for human consumption in Chile, went into effect in 1996. Originally, departments of environmental programs that fell under the responsibility of the Health Services were responsible for inspections and overseeing compliance with the legislation. Beginning 1 January 2005, these duties were assumed by each region's SEREMI.

Chile has a national supplementary food program, whose beneficiaries are children under 6 years old and pregnant women.

Food is delivered through primary care facilities. Milk, grains, and rice are provided in amounts tied to the nutritional condition of the beneficiaries. Recently, additional supplementary food programs were created for premature infants and children suffering from phenylketonuria. There is also a supplementary food program for schoolchildren operated by the National School Assistance and Grants Board, which provides breakfast and lunch in schools, based on the socioeconomic classification of the children and their families. In recent years, a supplementary food program has been established for older adults. The country also operates wheat flour fortification and salt iodization programs.

New regulations governing food safety are designed to provide basic health standards for the health, safety, and nutritional value of food, as well as dietary guidelines. There also is a nationwide control and hygiene program and coordination, which is supported by the national network of food science. In terms of food safety and control activities pursuant to the Health Code, 60,000 food samples are analyzed each year. The samples are subjected to microbiological tests (75%), chemical-bromatological tests (20%), and parasitological tests (5%).

In light of the 2002 outbreak of avian influenza in Chile, measures have been stepped up to prevent this and other pathologies of interest in animal health from being introduced into the country. Currently the Agricultural and Livestock Services carry out control and surveillance activities on birds, pigs, and horses, but no new outbreaks of avian influenza have been detected in the country since 2002.

### Individual Care Services

The public health care network is composed of outpatient and hospital facilities offering services of different complexity. They include 196 hospitals, 60 of which are high-complexity hospitals (23 type-1 and 37 type-2). There are 99 rural (type-4) hospitals. Additionally, 14 private hospitals also are part of the network, providing services to persons covered by public insurance plans under a delegation agreement. The public outpatient network includes 594 primary health care centers: 258 general clinics located in urban areas and 151 rural clinics; 115 primary health care clinics attached to hospitals; and 70 family health centers. The country also operates 40 outpatient mental health centers; 5 health referral centers, which offer services in four core medical specialties (internal medicine, pediatrics, surgery, and gynecology/obstetrics); and 5 diagnostic and treatment centers or high-complexity outpatient facilities. The outpatient network also includes 1,165 rural health posts.

The National Health Services System performed 38,089,674 medical consultations and checkups in 2004, or 3.6 consultations per FONASA beneficiary. This represents an increase of 7.5% since 1999. Of this total, 93.7% were consultations and 6.3%, checkups. Between 2000 and 2005, primary health care medical consultations increased 27%; major surgeries, 17%; emergency

care visits, 22%; and hospital discharges remained stable. With regard to oral health, 14,773,772 consultations were reported in 2004, of which 3,770,032 (25.6%) were for preventive treatment and 7,835,598 (53.2%) were for dental repair; the remainder involved specialized care and emergency consultations. In 2005, 54,859,829 laboratory tests and 4,989,970 imaging studies were performed, which represent 2.2 and 0.2 tests per medical consultation, respectively. The Office of the Health Superintendent reported that 12,162,032 medical consultations, 13,844,703 laboratory tests, 3,002,066 imaging studies, and 315,777 surgical procedures were performed in the private sector in 2005, which represent 4.5 medical consultations and 5.1 laboratory tests per ISAPRE beneficiary.

The number of hospital beds in the public sector was 28,135 in 2005, or 2.6 beds per 1,000 FONASA beneficiaries; this represents a reduction of more than 10% in comparison to the 1990s, but the figure has stabilized over the last five years. The private sector has about 11,000 beds distributed among 223 hospitals, clinics, and maternity facilities.

In 2003, there were 1,599,280 discharges from the country's hospitals, of which 1,155,787 were public beneficiaries (72.3%); 252,879, ISAPREs beneficiaries; and the remainder other types of beneficiaries (especially workplace accident victims and schoolchildren). The bed occupancy rate in the public sector in 2003 was 76%, with an average length of stay of 6.1 days. The five most frequent causes of hospitalization were complications of pregnancy, childbirth, or the puerperium (20%); diseases of the digestive system (12%); diseases of the respiratory system (11%); injuries and poisonings (10%); and diseases of the genitourinary system (8%).

Emergency care is provided by hospital emergency services in hospitals and by emergency primary care services. The main private hospitals and clinics also offer emergency care. A pre-hospital emergency care system has been in place since the closing years of the 1990s; it includes rescue ambulances of different complexity and response capabilities, and a dispatching center. The system operates in the three most heavily populated regions (metropolitan Santiago, Valparaíso, and Bío-Bío); work is under way to extend it to the rest of the country.

Auxiliary diagnostic and therapeutic services are offered by the public and private sectors. In the public sector, services are located in hospitals and serve demand generated in ambulatory services, as well as in hospitals. They are complemented with a few community laboratories in urban "communes" in the major cities. In the private sector, auxiliary diagnostic and therapeutic services are offered by units in private hospitals or clinics or through establishments that offer these services exclusively. Blood banks are primarily linked to public hospitals and to the largest private hospitals. In an effort to improve quality and safety by adopting international quality standards in the processing of blood and blood products, the number of blood banks has been reduced from 120 to 70. The objective is to limit pro-

duction nationwide to only four major blood and tissue banks. Another focus of blood-bank policy has been to promote volunteer donations, which helped increase volunteer blood donations from 2% in 2002 to 8% in 2005. The public health system receives about 180,000 blood donations annually.

Dental care is provided by public and private providers. In the public sector, the oral health program gives priority to comprehensive care for children and pregnant women and offers emergency services for the rest of the population. Treatment is provided through primary health care clinics, with some hospitals providing specialized services. The Ministry of Health's program for children has stepped up its preventive approach by including comprehensive oral health among the 56 health problems covered in the AUGE Plan. This effort is complemented by the operation of dental clinics in municipal schools, which are subsidized by the Ministry of Education through the National School Assistance and Grants Board. Some ISAPREs are beginning to institutionalize private dental care in provider networks, although coverage is still low. Treatment has been complemented by public health actions, such as fluoridation of drinking water.

Mental health is the area with the greatest mismatch between supply and demand in both the public and private sectors. In the public sector, long-term specialized hospital care is only provided in three establishments. Acute care is provided in those same establishments, as well as by psychiatric services in some general hospitals. In recent years, under the national plan for psychiatric care and mental health, the establishment of shelters to deinstitutionalize some patients and encourage their reentry into society has been promoted. The public system also provides outpatient care at community mental health centers in some urban "communes," which are administered by the respective municipalities and include 40 establishments nationwide. The ISAPREs offer only minimal coverage for psychiatric care in their health plans. The conditions covered under the AUGE Plan include depression, alcohol and chemical dependency, and psychoses, which are expected to improve the supply of mental health services and reduce disparities in access among different groups of the population.

Reproductive health services are provided by the network of public and private suppliers. The Ministry's program includes family planning and contraceptive distribution (hormonal, intrauterine devices, diaphragms), which are provided free of cost at primary health care establishments. Normal pregnancies are monitored at primary health care facilities and high-risk cases are referred to hospitals. Both the public and private sectors have centers that offer infertility treatment, but coverage remains low. Emergency birth control has only recently been added to the services offered at public health establishments.

Geriatric services are scarce in the public and private sectors. Public care is offered through the general services provided by primary-level facilities and general hospitals. There is only one specialized center (the Geriatric Institute in the Santiago metro-

politan region), which has limited capacity. The private sector has residences for older adults that offer care.

Cancer treatment is provided in some specialized public and private facilities, which offer surgery, chemotherapy, and radiotherapy. The National Cancer Institute and three other regional centers that are somewhat less developed are operated by the public sector. The Ministry has established national chemotherapy programs for certain types of childhood and adult cancers. The private sector has centers that offer radiation therapy, and some have entered into an agreement whereby they provide treatment for public insurance beneficiaries. Childhood cancers, cervical cancer, breast cancer, leukemia and lymphoma (adults), testicular cancer, prostate cancer, stomach cancer, gallbladder and biliary tract cancers, and terminal cancers (palliative care) are included under the AUGE Plan's covered health problems.

Rehabilitation services are provided in public and private establishments, although coverage is low in both. In the public sector, there are some national reference centers for adults in the Northern Metropolitan Santiago Health Service and centers for children in the Eastern Metropolitan Santiago Health Service. Some establishments in other regions also offer rehabilitation services, such as the regional hospital in Concepción. In the private sector, the most important services are provided by a non-profit foundation, the Children's Rehabilitation Institute, which has centers in the Santiago metropolitan region and other parts of the country. The National Disability Fund was created in 1994 as an agency of the Ministry of Planning and Coordination; it conducted the first national survey on disabilities in 2005.

### Health Promotion

The broad objectives of the 1997 National Health Plan are to promote healthy lifestyles and a healthy environment, increase individual and community understanding and capacity for self-care, and bolster the State's regulatory function with respect to health determinants. The National Council for Health Promotion (Vida Chile) was established as an intersectoral agency composed of 24 national institutions; it is responsible for advising ministries and regional and local governments, supporting implementation of community plans, and recommending public health policies. To achieve these objectives it relies on strategies that include programs for healthy communities, health-promoting schools, the "Health for People" program, healthy workplaces, and the CARMEN project. In 2001, there were 305 community health promotion plans; the strategy of health-promoting schools has been introduced in 2,435 educational institutions and 32 schools have been accredited by the health sector as health-promoting schools. Chile's Government is signatory to the agreements issued at the Fifth Global Conference on Health Promotion (Mexico, 2000). In 2002, the country's health promotion plan evaluated, revealing positive results among the group exposed to health promotion plans, as compared to similar target populations that had no such exposure.

### Health Supplies

Chile's pharmaceuticals market is characterized by the circulation of significant amounts of generic drugs, a large presence of national laboratories, and operation of the Ministry of Health's Central Supply Clearinghouse. There are no price controls on drugs. In 2002, generic drugs accounted for 39.3% of units sold; trademark generics, 38.5%; and brand-name products, 22.1% (21). In terms of sales, generic drugs account for only 7.7% of the market, trademark generics for 49%, and brand-name drugs for 43.3%. This large share of the market held by generic drugs has reduced the average price of drugs, to US\$ 3.03 in 2002. The leading laboratory was Laboratorio Chile (27% of the market). In terms of the total number of patent applications filed with the Ministry of Economy between October 1991 and April 2002, 19% were for pharmaceutical patents. With respect to patents granted, 43% originated in the United States and 24% in Europe. There are some 1,500 community pharmacies in the country, of which 37% are owned by three franchises (Salco-Brand, Ahumada, and Cruz Verde) that control 90% of the market (22). This oligopoly leads to a problem in the vertical integration between the production and sale of a number of pharmaceutical products. In addition, 35 of the country's "communes" with more than 10,000 inhabitants do not have a community pharmacy.

The objective of the national drug policy is to ensure that the entire population has access to an adequate supply of the drugs included on the country's essential drugs list. Furthermore, it seeks to guarantee drug efficacy, quality, and safety; affordable prices for drugs; and a rational use of drugs, with a view to obtaining the maximum benefits while controlling costs. The annual average cost per beneficiary in the public sector is US\$ 8.00 (23). Pharmaceutical sales dropped from US\$ 567 million to US\$ 501 million between 1999 and 2002; nevertheless, the number of units sold held steady at about 168 million. In 2002, the price per unit of generic, trademark generic, and brand-name pharmaceuticals was US\$ 0.59, US\$ 3.86, and US\$ 5.96, respectively. There is a 6.5 times difference in the spending of the highest income quintile and the lowest. Moreover, the highest-income quintile accounts for half of all drug purchases, while the lowest-income quintile accounts for only 7.3% (20). In the public sector, the Ministry of Health's Central Supply Clearinghouse consolidates and facilitates procurement for facilities that want to use its services. It also functions as the official distributor of the products included in national public health programs, such as vaccines and tuberculosis drugs. Private pharmacies, where most drug units in the country are sold, are required to have a pharmacist on board. A pharmacist must also be on the premises in public hospitals, but not private clinics.

In 2003, the Public Health Institute suspended its production of immunobiologicals (DPT, diphtheria toxoid, typhoid, rabies, and tetanus vaccines) to instead concentrate on improving its regulatory, supervisory, and control functions as an agency of the national health authority. Reagents and immunobiologicals

produced by private sector companies must be authorized by the Public Health Institute before they can be sold on the national market.

During the 1990s, some US\$ 260 million was invested in the public network for construction works and medical equipping, most of which was used to build or rebuild 13 hospitals. Another 53 hospitals and 13 clinics or specialty facilities were renovated, at a cost of US\$ 180 million and US\$ 105 million, respectively. Regional studies carried out by the public health network during the late 1990s inventoried equipment valued at US\$ 571 million, of which US\$ 523 million was medical and industrial equipment, and the remaining US\$ 48 million vehicles. Investments associated with implementation of the AUGE Plan included US\$ 24.6 million in 2005, US\$ 22.3 million in 2006, as well as an additional US\$ 66.3 million for the construction of 31 new clinics.

### Human Resources

According to recent studies (22), the country has 25,542 practicing physicians, of whom 2,276 were trained abroad and directly accredited by the Ministry of Foreign Relations, while 963 are immigrants who have had their medical degrees reaccredited in Chile. Of them, 14,306, or 56%, are physicians certified in specialized areas of medicine. According to the College of Physicians, the country currently has 20,146 physicians (membership in the College of Physicians is not mandatory). The physician-population ratio increased from 1:921 in 1998 to 1:612 in 2004. With respect to public (FONASA) beneficiaries, there are 8.45 physicians per 10,000 population, and their distribution by region ranges from 6 to 16 physicians per 10,000 beneficiaries. Of all licensed physicians, only 42.3% are employed by the National Health Services System. Most physicians working in the public sector are medical specialists (61%). Of them, 13% are employed by the municipalities. The 12 faculties of medicine (9 public and 3 private) graduate about 600 new doctors a year. According to estimates, the country has 18,000 nurses, but only 8,000 work in the public sector. In 2004, there were roughly 60,000 professionals, technicians, and health assistants in the public sector, and one nurse for every three physicians. In that year, the public health sector employed 90,000 people, which indicates that administrative and service staff accounted for one-third of the total. Despite an increase of approximately 5,000 physicians and 1,000 nurses between 1990 and 2000, there are glaring shortages of certain professionals, such as nurses and ophthalmologists.

Professional degrees may be granted only by universities, which are regulated by the Ministry of Education. The legal framework does not make it mandatory to obtain certification in a medical specialty after obtaining a degree in general medicine. Certification of a specialty (or subspecialty) is granted by universities after a period of formal training. For physicians who have not followed a formal course taught by a university, there is an al-

ternative mechanism for certification of medical specialists through a national certification board; universities and specialist scientific societies sit on the board.

According to the changes mandated by the health reforms (Law No. 19,937), the Ministry, in conjunction with the Ministry of Education, is charged with establishing a certification system for individual providers in medical specialties and subspecialties. The Office of the Health Superintendent is charged with certification oversight for all public and private health care providers, including individuals. Accordingly, the Office of the Health Superintendent is required to compile a national list of certified individual providers and another one of certifying entities.

### Research and Technological Development in Health

The Government, through the National Science and Technology Council, provides incentives for health research, which is geared more toward basic sciences and clinical areas than to public health. To promote essential research on the country's priority health problems, the Ministry of Health has developed a national research policy directed to health policies and has established the Research and Technology Commission, whose members are drawn from the faculties of medical and public health schools and departments in the country's main universities; it also has created the National Health Research Fund. Since 1994, the Fund has hosted an annual competition for public health research projects. The competition attracts some 600 project submissions each year, from which about 30 are selected. The maximum amount of funding per project is about US\$ 40,000.

In the last few years, scientific information has begun to be presented electronically to facilitate access by different users. Progress has been made in establishing a virtual health library, whose consultative committee is composed of representatives of the Ministry of Health, the library of the University of Chile's Faculty of Medicine and Public Health School, the National Science and Technology Research Council, the National Library of Congress, and the Society of Editors of Scientific Journals.

The Health Technology Assessment Unit began operations in 1997; this agency of the Ministry of Health became the Chilean Health Technology Assessment Agency a year later. The Agency maintains institutional ties to the International Network of Agencies for Health Technology Assessment and the International Society for Technology Assessment in Health Care. At present, the focus of the Agency's work includes drafting assessment reports which examine and summarize scientific evidence to assist authorities and other users in decision-making; preparing methodology guidelines which scrutinize topics associated with the compilation, analysis, and application of scientific information in the health field, and for hospital quality management applications; and disseminating controlled clinical trials at the national level.

### Health Sector Expenditures and Financing

According to national health statistics compiled by FONASA (23), average per capita spending in 2003 for the FONASA beneficiary population was US\$ 177; for the ISAPRE beneficiary population, the figure was US\$ 332. The public sector is financed from Government contributions, quotas, and co-payments by members of FONASA and the ISAPRES. In 2003, Government contributions accounted for 27.2% of total funding for the health sector; FONASA contributions, for 17.4%; mandatory ISAPREs contributions, for 15.8%; and voluntary contributions, for 6.7%. Out-of-pocket spending represented 26.3%, half of which was co-payments for medications. In 2003, direct contributions by municipalities were estimated to average US\$ 6 per capita. With respect to public sector funding, Government contributions accounted for 51%, quotas for 34.9%, operating income for 6.4%, and user co-payments for 7.3%.

### External Technical Cooperation and Financing

In 2000–2004, external technical cooperation was received for projects on quality of life, transfusion medicine, mental health, and HIV/AIDS. Technical cooperation in the amount of US\$ 13 million was received to develop the first phase of a project aimed at expanding the response to HIV/AIDS (2003–2005), and US\$ 24.6 million for the second phase (2006–2008). In 2002, the Inter-American Development Bank (IDB) processed a US\$ 45 million loan for a two-phase indigenous health promotion project based on a multi-sector approach, the first of which was concluded in 2006. The total financial cooperation from PAHO was approximately US\$ 2.15 million for 2004–2005, and roughly the same for 2006–2007.

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