Mortality Comparisons

5

Most residents of developed countries can expect to live beyond the age of 70, and deaths at younger ages have become relatively infrequent. Consequently, measures of premature deaths occurring during early adulthood are increasingly being used to gauge the health status of populations. This chapter describes some commonly used mortality measures and provides data showing trends and the 1987-88[1] status of the United States and selected comparison countries.[2]

Mortality data are generally considered the most reliable sources of health indicators, because deaths in developed countries are generally reported in accordance with international reporting standards (67). The countries differ, however, in their use of diagnostic technology, their use of autopsy to confirm cause of death, and their training of medical personnel, which contributes to differences in how their physicians certify causes of death. Consequently, international comparisons of causes of death must be made cautiously (see appendix B) (67,160).

LIFE EXPECTANCY

Of all the comparison countries, residents of Japan have the highest life expectancy at birth (76.2 years for males and 82.1 years for females in 1990) and can expect to live 3 to 4 years longer than U.S. residents, whose life expectancy at birth (71.8

[1] The most recent year for which mortality data regarding Spain and New Zealand are published in the *World Health Statistics Annual is* **1987 (260,261,263,264).** Data for 1988 are presented for the other countries.

[2] Comparison countries include **Australia, Canada,** France, Germany, Italy, **Japan,** the Netherlands, New Zealand, Norway, **Spain, Sweden,** and the United Kingdom. Data for Germany are from the former Federal Republic of **Germany** and refer to West Germany.

years for males and 78.8 years for females in 1990) is among the lowest (table 5-1).[3] Since 1955-59, Japan has experienced a greater improvement in life expectancy at birth than any other developed country.[4] The United States, by contrast, has maintained its historically lower life expectancy (figure 5-l). Expected years of remaining life can be measured at various ages and is lower in the United States than in most other countries up to the age of 80, at which point the U.S. position improves somewhat compared with other countries (table 5-l).

SURVIVAL TO ADULTHOOD

U.S. residents are less likely than residents of the other countries to survive to the age of 45 or 65 (e.g., the proportion of males who reach 65 is 74 percent in the United States and 83 percent in Japan) (table 5-2). Even though infant and child mortality are higher in the United States than in most of the comparison countries, such deaths are relatively few and differences in adult mortality account for most of the disparities in the survival rates (table 5-2). In fact, individuals who survive childhood and reach the age of 25 are less likely to reach 65 in the United States than in any of the comparison countries (e.g., the proportion of 25-year-old males who survive to age 65 is 76 percent in the United States and 84 percent in Japan) (figure 5-2).[5]

YEARS OF POTENTIAL LIFE LOST

An indicator of premature or untimely death is "years of potential life lost" (YPLL) (107). If deaths prior to the age of 65 were considered premature, an individual dying at the age of 20 would have lost 45 years of potential life.[6] Not all premature deaths are avoidable, and YPLL is really a measure of mortality prior to the attainment of old age. A country's YPLL increases when conditions that affect children and youth (e.g., birth defects, injuries, AIDS) result in death, but chronic diseases that cause death at older ages have little effect on YPLL. Of the comparison countries, Japan and Sweden have the lowest YPLL and the United States has the highest YPLL, reflecting the relatively high U.S. infant and child mortality rates (figure 5-3) (209).

AGE-SPECIFIC MORTALITY

Compared with the rates of the other countries, U.S. age-specific death rates[7] are among the highest up to the age of 65, and then are relatively lower (figures C-1 and C-2).[8] U.S. rates are especially high during adolescence and early adulthood (i.e., the ages of 15 to 24 and 25 to 34). For males in these age groups, for example, the U.S. death rates are more than twice those of Japan and the Netherlands.

U.S. death rates for ages up to 65 have been consistently high from the 1950s to the 1980s (tables C-1 and C-2). Of the 13 comparison

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[3] Life expectancy is the average number of years an individual is expected to live and can be measured from birth or subsequent ages Life expectancy is calculated from life tables, which are constructed using current age-specific death rates, as if these rates would remain unchanged throughout the lifetime of the cohort. Life expectancy for infants born in the 1980s, for example, is calculated from 1980 age-specific death rates even though the 1980 birth cohort will, as it ages, be subjected to the age-specific rates prevailing in 1990, 2000, and subsequent years.

[4] Declining death rates among those aged 55 and older have contributed largely to increases in Japan's life expectancy (277).

[5] The probability that a person surviving to a certain age (e.g., 25) will survive to another age (e.g., 65 years) is called temporary life expectancy (3). This measure is useful whensummarizing the mortality experience for different broad age groups (99).

[6] No agreement has been reached regarding the age or age limits considered for the determination of YPLL. Some calculate it for the age group 1 to 64, whereas others calculate it either from birth or through the age of 69 (57). The Centers for Disease Control and Prevention (CDC) used the ages 1 through 65 in its calculation of YPLL until 1986, when it began including mortality during the first year of life (206). More recently, CDC has estimated YPLL before the age of 85 (205).

[7] The age-specific death rate is the annual number of deaths among persons of a given age group divided by the estimated mid-year population of that age group (114).

[8] Figures and tables designated by a C are in appendix C.

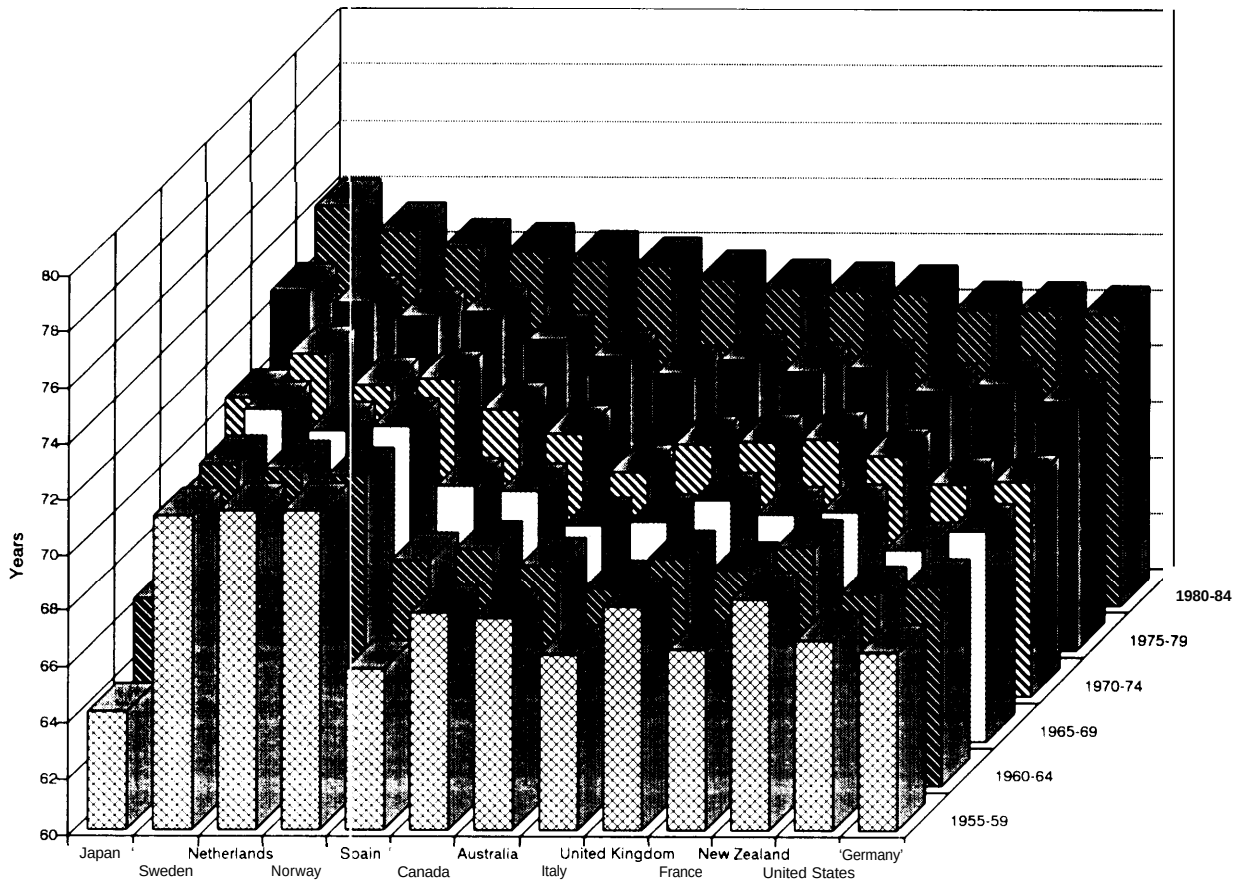
Table 5-l-Life Expectancy at Birth and at Ages 15, 45,65 and 80, United States and Selected Countries, 1990

	At birth		Age 15		Age 45		~			~
country	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
United States	**71.80**	78.80	57.90	**64.70**	**30.70**	**35.90**	**15.10**	**18.90**	**7.10**	***9.00***
Australia	**73.61**	80.05	59.57	**65.81**	**31.35**	36.67	**15.05**	**19.05**	**6.92**	***8.80***
Canada	**73.81**	81.11	59.75	**66.86**	**31.70**	37.83	**15.80**	**20.69**	**8.20**	**10.99**
France	**73.37**	81.76	59.25	***67.50***	**31.56**	38.53	**15.98**	**20.69**	**7.40**	9.52
Germany[a]	**72.63**	79.16	58.47	***64.86***	**30.16**	35.79	**14.24**	**18.18**	**6.27**	7.98
Italy	**73.58**	80.31	59.51	66.11	**31.07**	36.88	**14.96**	**19.03**	**6.94**	8.65
Japan	**76.17**	82.05	61.79	67.57	**33.10**	38.29	**16.35**	**20.11**	**7.07**	8.91
Netherlands	**74.17**	81.08	60.07	66.84	**31.33**	37.66	**14.94**	**20.02**	**7.07**	9.81
New Zealand	**71.57**	79.27	57.73	65.28	**29.99**	36.37	**14.09**	**19.26**	**6.60**	9.70
Norway	**73.29**	80.77	59.22	66.50	**30.84**	37.26	**14.85**	**19.51**	**7.02**	9.29
Spain	**73.58**	80.54	59.54	66.32	**31.42**	37.14	**15.35**	**19.10**	**7.00**	8.42
Sweden	**74.70**	80.73	60.39	66.34	**31.97**	37.21	**15.51**	**19.54**	**7.21**	9.28
United Kingdom	**73.03**	78.68	58.95	64.44	**30.35**	35.26	**14.12**	**18.00**	**6.62**	8.46

aBased on data from the former Federal Republic Of Germany.

SOURCES: M. MacDorman, National Center for Health Statistics, *Centers* for Disease Control and Prevention, Public Health Service, U.S. Department of Health and Human Services, Hyattsville, MD, personal communication, Sept. 1993; U.S. Department of Commerce, Bureau of the Census, Center for International Research, unpublished tabulations, Suitland, MD, 1992.

Figure 5-l—Trends in Life Expectancy at Birth, United States and Selected Countries, Males, 1955-84

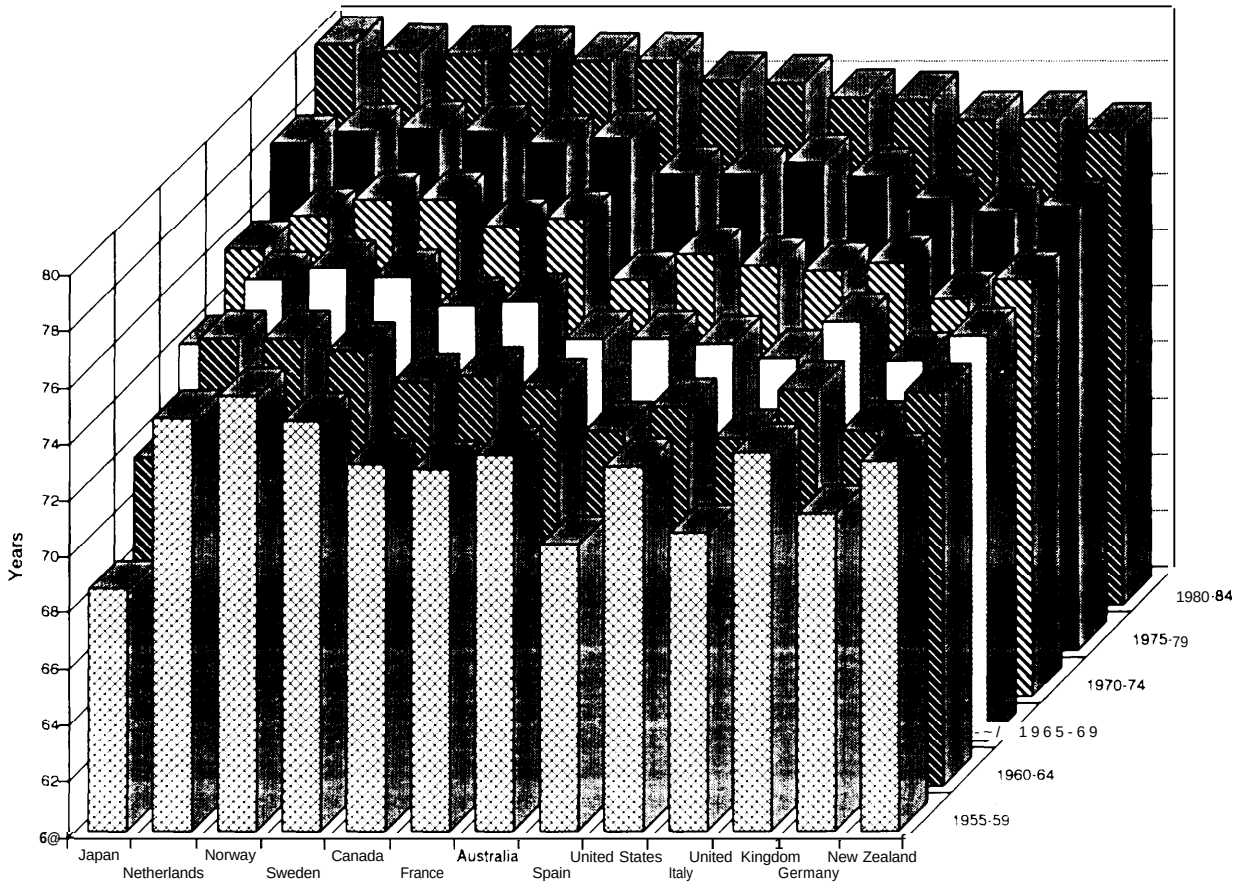


countries, Japan showed the most pronounced decline in rates for every sex and age group during that period. In general, agc-specific mortality declines within the United States did not keep pace with those of the comparison countries, and the United States showed relatively poor improvement for some age groups. The United States, for example, showed the lowest decline in mortality among men aged 25 to 34. Nonetheless, the U.S. decline in mortality among men aged 45 to 54 was second only to the Japanese decline. But, even this improvement was insufficient to boost the relative international standing of the United States. By the late 1980s, the U.S. death rate for men aged 45 to 54 was the second highest of the 13 comparison countries (only France's rate was higher) (figure C-l).

CAUSE-SPECIFIC MORTALITY COMPARISONS

This section presents cause-specific death rates and trends for five categories that account for most deaths in developed countries: accidents; homicide and other violence; cancer; circulatory system disease; and infectious and parasitic diseases. Examining such broad categories of disease minimizes the effects of international cause-of-death reporting differences (see appendix B).

Figure 5-l—Trends in Life Expectancy at Birth, United States and Selected Countries, Females, 1955-84



SOURCE: World Health Organization, World*Health Statistics Annual:* 1986 (Geneva, Switzerland: World Health Organization, 1986).

Accidents, Homicide, and Other Violence

Adolescent and young adult mortality is especially high in the United States, compared with other developed countries. Leading causes of death among U.S. residents aged 15 to 44 include accidents (e.g., motor vehicle accidents, falls, poisonings),[9] homicide, and other violence. For individuals aged 15 to 24, these causes account for more than one-half of U.S. deaths (table C-3). The U.S. rates of accident-related death for persons aged 15 to 44 are exceeded only by those of New Zealand.[10] The rates of accident-related deaths in many of the other comparison countries are half that of the United States for this age group (e.g., the Netherlands, United Kingdom, Japan) (figures C-3 and C-4).[11]

[9] Accidents and adverse effects include International Classification of Diseases (ICD-9) codes E800 through E949 (254).

[10] In the United States, motor vehicle accidents account for between one-half and three-quarters of accident-related deaths among those aged 15 to 44. Rates of death by motor vehicle accidents in the United States are exceeded only in New Zealand.

[11] Accidental death rates for the elderly (65 and older) are highest in France, among the lowest in the United Kingdom, and intermediate in the United States.

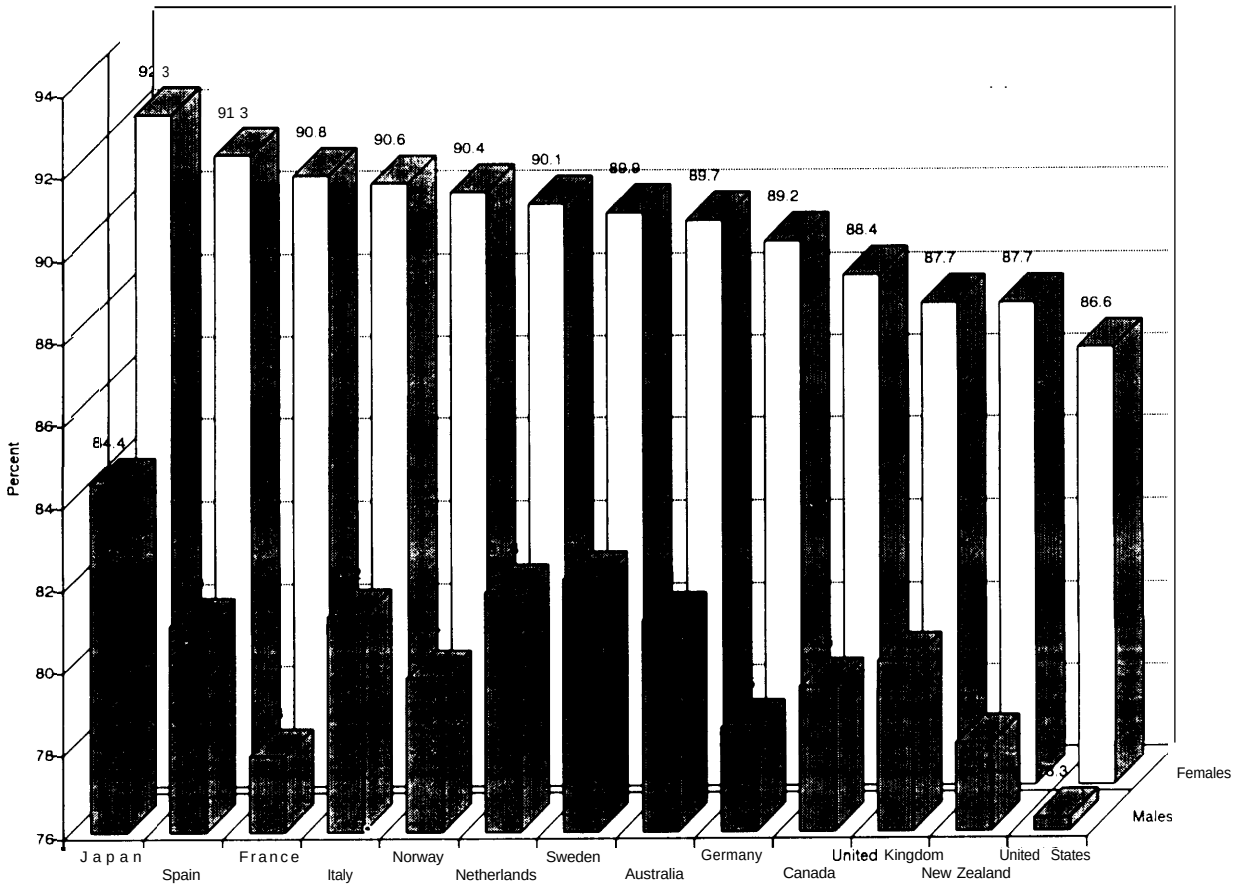
Table 5-2-Percent of Population Surviving to the Age of 1, 25,45, and 65, United States and Selected Countries, 1990

	Male				Female			
Survival to age... Country	1	25	45	65	1	25	45	65
United States	99.0%	97.1%	92.1	74.1%	99.2%	98.4%	96.3%	85.1%
Australia	99.1	97.5	94.7	79.0	99.3	98.6	97.3	88.5
Canada	99.2	97.6	94.4	77.6	99.4	98.7	97.1	87.2
France	99.2	97.7	93.5	76.1	99.4	98.7	97.0	89.7
Germany[a]	99.2	98.0	94.8	77.0	99.4	98.8	97.1	88.1
Italy	99.1	97.8	95.2	78.4	99.3	98.7	97.4	89.4
Japan	99.5	98.5	96.3	83.1	99.6	99.1	97.9	91.5
Netherlands	99.2	98.1	95.9	80.2	99.4	98.8	97.4	89.0
New Zealand	98.9	96.6	93.3	75.5	99.1	98.2	96.5	86.1
Norway	99.2	97.7	95.0	77.9	99.4	98.8	97.5	89.4
Spain	99.2	97.7	94.4	78.2	99.3	98.7	97.3	90.1
Sweden	99.3	98.3	95.5	80.7	99.5	99.0	97.4	89.0
United Kingdom	99.1	97.9	95.5	78.4	99.3	98.7	97.2	86.6

aBased on data from the former Federal Republic of Germany.

SOURCES: M. MacDorman, National Center for Health Statistics, Centers for Disease Control and Prevention, Public Health service, U.S. Department of Health and Human Services, Hyattsville, MD, personal communication, Sept. 1993; U.S. Department of Commerce, Bureau of the Census, Center for International Research, unpublished tabulations, Suitland, MD, 1992.

Figure 5-2—Probability of Survival to Age 65 for Those Surviving to Age 25, United States and Selected Countries,[a] 1990



a Data for Germany from the former Federal Republic of Germany.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Center for International Research, unpublished tabulations, Suitland, MD, 1992.

The U.S. rates of age-specific homicide and other violence[12] for residents aged 15 to 34 are at least twice as high as the rates of any of the comparison countries (figures C-5 and C-6). The Swedish homicide rate surpasses the U.S. rate at the age of 35 for women and 45 for men. In most countries, including the United States, mortality from accidents, homicide, and other violence have declined since the 1950s (figure C-7).[13]

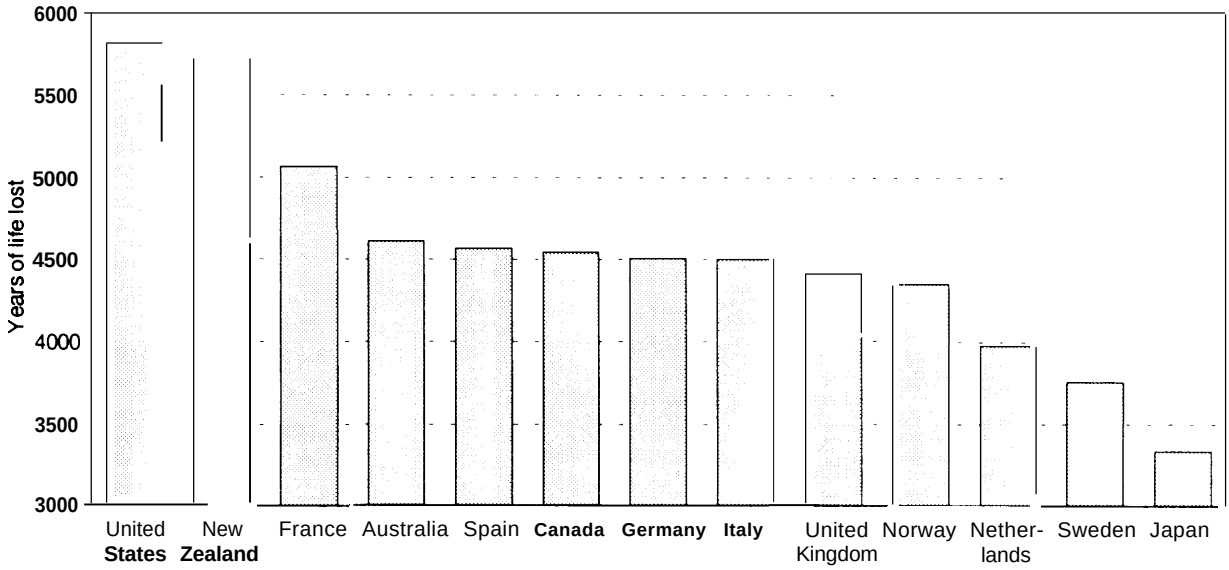
U.S. rates of fatalities from motor vehicle accidents are among the highest when measured in terms of total population, but are relatively low when measured in terms of vehicle miles traveled (table 5-3).

Cancer and circulatory system disease overtake accidents as the leading causes of deaths for U.S. residents aged 45 and above (table C-3).

12 Homicide, injury purposely inflicted by other persons, and other violence include ICD-9 codes E960 through E999 (254).

13 The trend data are based on age-standardized death rates (European standard) and include motor vehicle accidents, poisoning, suicide, homicide, and other violence (ICD-9 codes E800-E999). In the United States, homicide rates have increased somewhat, while accident-related death rates have declined.

Figure 5-&Years of Potential Life Lost Before Age 65, United States and Selected Countries, 1964-67°



a Year of data for Spain is 1984; for Italy, 1985; for Australia, Canada, France, Netherlands, New Zealand, Norway, Sweden, and United States, 1986; for Germany, Japan, and United Kingdom, 1967. Data for Germany from the former Federal Republic of Germany.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, "Mortality in Developed Countries," Morbidity and *Mopртality* Weekly *Report 39(13) 205-209,* April 6, 1990.

Cancer

For persons aged 45 to 64, death rates from cancer[14] were intermediate in the United States compared with those of other industrialized countries in 1988 (figures C-8 and C-9). Comparison countries show different trends in age-specific rates of death from cancer between 1955-59 and 1980-84 (table C-4). For example, the rates of death from cancer for men 45 to 54 years old increased during this period in all countries but the United Kingdom, Netherlands, and Japan, whereas the corresponding rates for women declined in all but the United Kingdom, New Zealand, and Australia,

Combining mortality data for all cancers masks trends that diverge by cancer site. Data on age-standardized death rate[15] trends show that cancers of the trachea, bronchus, and lung have increased greatly while stomach cancer has declined between 1955-59 and 1980-84 for both men and women in all comparison countries. During this period, death from breast cancer mortality has increased for women in all countries but Sweden (table C-5).

Among the factors that might lead to international differences in cancer death rates are disparities in genetic predisposition to cancer, the prevalence of risky behaviors (such as smoking), environmental conditions, survival of cancer patients, the extent to which physicians diagnose cancer and report it on death certificates, and how death certificates are coded. Sorting out the relative role each of these factors plays in causing international differences in cancer mortality lev-

14 Cancer (i.e., malignant neoplasms) includes ICD-9 codes 140 through 208 (254).

15 Age-adjusted death rates are calculated by applying comparison countries' age-specific death rates to an arbitrarily chosen standard population with a known age distribution. Comparisons are made with the number of expected deaths observed in the standard population (1 14).

Table 5-3--Rates of Motor-Vehicle-Related Deaths, Selected Countries, Circa 1990

Country	Year	Death rate (per 100,000 population)	Death rate (per 100 million vehicle miles traveled)[a]
United States	1988	19.54	2.1
France	1989	18.15	3.9
Germany[b]	1989	12.26	2.8
Japan	1990	11.73	3.1
Netherlands	1989	9.44	2.3
Norway	1989	9.13	2.0
Spain	1987	17.27	10.9
Sweden	1988	9.59	1.9
United Kingdom	1990	9.80	2.1

aDeath rates per 100 million vehicle miles traveled are for 1990 for all countries.

bBased on data from the former Federal Republic of Germany.

SOURCES: L. Hall, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, DC, personal communication, March 1993; World Health Organization, *World Health Statistics Annual* (Geneva, Switzerland, World Health Organization, 1991 and 1992).

els and trends is the subject of study and debate (34,37,66,79,87,275).[16] Recent studies suggest that some of the increase in reported cancer deaths might be secondary to increased use of diagnostic tests, especially among the elderly (47,78,109, 117,118).

Circulatory System Disease

U.S. rates of death from circulatory system disease[17] were at their highest between 1955 and 1959,[18] have declined precipitously since then (figure C-10), but remain among the highest relative to comparison countries (figures C-11 and C-12).19 For men and women 45 to 64 years old, 1987-88 rates of death from circulatory system diseases were highest in the United States, New Zealand, and the United Kingdom and lowest in Japan and France.

Circulatory system disease includes disorders with different underlying causes. Atherosclerosis, for example, is a major risk factor for ischemic heart disease and hypertension is a major underlying risk factor for cerebrovascular disease. Some suggest that vital statistics cannot be used to accurately determine secular trends in types of heart disease (174), in part because physicians in some countries tend to use certain diagnostic categories, such as ischemic heart disease, more often than do their counterparts in other countries (179,184).[20]

Trend data, though imperfect, indicate that cerebrovascular disease[21] rates have declined in all countries (table C-6). For men, ischemic heart

16 The congressional General Accounting Office will publish a comparison of survival from cancers of the lung, colon, and breast and Hodgkin's lymphoma in the United States and Canada (139).

17 Circulatory system diseases include ICD-9 codes 390 through 459 (254).

18 Age-standardized (European standard) rates were higher in the United States than in any Of the 12 comparison countries (261).

19 Fo, U.S. males aged 35 t. 64, death rates from heart disease dropped by more than one-third between 1955-59 and 1980-84. By contrast, heart disease rates in Germany and Sweden have historically been low and have remained relatively stable during this period (260)

20 The way heart diseases are reported is also affected by changes in the ICD over time (especially the change from ICD-7 to ICD-8). When circulatory system diseases are analyzed as a group, the effects of these ICI) changes are minimized (184).

21 Cerebrovascular disease includes ICD-9 codes 430-438 (254).

disease[22] mortality rates vary: They have declined markedly in the United States, Italy, and Canada; have remained relatively stable in Germany and Spain; and have increased in Sweden, France, and Norway (table C-6). For women, rates of death from ischemic heart disease mortality have declined in all countries but France.[23]

Factors that may have contributed to the decline in heart disease in the United States and elsewhere include reductions in coronary risk factors such as cigarette smoking, hypertension, and high-fat diets, and improvements in medical therapy for patients with heart disease (59).[24] The World Health organization's MONICA project,[25] an international study of risk factors for cardiovascular diseases, is assessing the extent to which trends in coronary heart disease and cerebrovascular disease are related to such factors as smoking, blood pressure, cholesterol, and body-mass index (249).[26]

Infectious and Parasitic Diseases

Deaths from infectious and parasitic diseases[27] are most common among the elderly, but increasingly, deaths related to human immunodeficiency virus (HIV) infection are important causes of death among young people.[28] The United States had the highest infectious disease-related 1987-88 death rates among men and women aged 24 to 64. Among elderly men and women (age 65 and older), infectious and parasitic disease death rates (primarily septicemia) are highest in Japan and the United States (table C-3).

United States and Canada Mortality Comparisons

Mortality rates are lower for Canadian residents than for U.S. residents at almost every age. If the United States had had the same age-specific death rates as Canada in 1989, about 200,000 fewer U.S. residents would have died-a difference of 9 percent (table 54).[29,30] The deaths of more than one-quarter of the children (under the age of 15) and more than one-third of the men aged 25 to 44 who died in the United States that year could be viewed as "excess" deaths relative to Canada's mortality experience. An examination of the leading causes of death by age in the United States shows that higher U.S. rates of homicide and HIV and acquired immunodeficiency syndrome (AIDS) account for much of the differential among young people (ages 15 to 24), but that higher U.S. rates of death from heart disease account for most of the excess deaths, which are concentrated in the over-44 age group.[31]

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22 Ischemic heart disease includes ICD-9 codes 410-414 (254).

23 In most countries, ischemic heart disease is a more common cause of death than cerebrovascular disease. The reverse appears to be true in Japan, where cerebrovascular disease is the predominant cause of circulatory disease death. Some evidence suggests that this trend might result from reporting, because Japanese physicians appear to over-diagnose cerebral stroke (72).

24 Improvements in hospital care (e. g., the use of coronary care units) for patients suffering acute myocardial infarction was not found to contribute to declines in U.S. rates of death from acute myocardial infarction between 1973-74 and 1978-79 (60).

25 The acronym MONICA stands for *MONI*toring of trends and determinants in Cardiovascular diseases (248).

26 Data on risk factors are being gathered through population-based surveys of areas served by collaborating centers in 27 countries. Stanford, California is the only U.S. center represented in WHO's MONICA project (248).

27 Infectious and parasitic diseases include ICD-9 codes 001-139, but exclude codes 480-486 (pneumonia),

28 Data on the incidence of AIDS is provided in chapter 6.

29 If the United States had the same age-specific death rates as Canada, an estimated 96,234 fewer males and 95,979 fewer females would have died.

30 If the comparison were confined to the U.S. white population, there would have been 5 percent fewer deaths in the United States.

31 Even though the proportion of U.S. deaths considered excess is highest for younger age groups, most excess U.S. deaths are concentrated among men aged 25 to 64 and women aged 65 and older, because that is when most deaths occur (table C-5).

Table 5-4-Expected U.S. Deaths If United States Had Canadian Age-Specific Mortality Rates, 1989

	U.S. deaths number	Expected U.S. deaths if Canadian rates	Excess U.S. deaths		Percentage of U.S. deaths that are excess deaths
			Number	Percent	
Male					
Under 15	31,895	23,375	8,520	8.9%	26.7%
15 to 24	27,165	22,406	4,759	4.9	17.5
25 to 44	99,482	63,825	35,657	37.1	35.8
45 to 64	234,432	193,840	40,592	42.2	17.3
65 and older	720,811	714,105	6,706	7.0	0.9
All ages	1,113,785	1,017,551	96,234	100,0	8.6
Female					
Under 15	23,966	17,404	6,562	6.8%	27.4%
15 to 24	9,323	7,529	1,794	1.9	19.2
25 to 44	41,961	31,109	10,852	11.3	25.9
45 to 64	143,892	115,086	28,806	30.0	20.0
65 and older	816,977	769,012	47,965	50.0	5.9
All ages	1,036,119	940,140	95,979	100.0	9.3

SOURCES: Statistics Canada, The Leading Causes of Death at Different Ages, (Ottawa, Ontario: Statistics Canada, 1989); U.S. Department of Commerce, Bureau of the Census, U.S. *Population Estimates, by Age, Sex, Race, and Hispanic* Origin: 1980-1991 (P25-1095) (Washington, DC: U.S. Department of Commerce, February 1993); U.S. Department of Health and Human Services, Public Health Services, Centers for Disease Control and Prevention, National Center for Health Statistics, *Advance Report of* Final *Mortality Statistics, 1989,* Monthly Vital Statistics Report 40(8), suppl. 2, Jan. 7, 1992;.

AGES 15 TO 24

Homicide is the second leading cause of death for U.S. residents aged 15 to 24 and accounts for as many as 19 percent of males' deaths and 12 percent of females' deaths in this age group (tables C-7 and C-8). In Canada, homicide accounts for 3 percent of males' deaths and 5 percent of females' deaths in this age group. If U.S. homicide rates were as low as Canada's, the U.S. overall death rate for young adult males would be comparable to Canada's (119.6 vs. 117.5 per 100,000).

AGES 25 TO 44

Death rates for this age group are 55 percent higher for males and 35 percent higher for females in the United States than in Canada (tables C-9 and C-10). Much higher rates of HIV and AIDS, homicide, and chronic liver disease in the United States account for the fact that its death rates are higher than Canada's. Homicide rates, for example, are five times as high for males in the United States as in Canada.

AGES 45 TO 64

Death **rates** for this age group are 22 percent higher for males and 26 percent higher for females in the United States than in Canada. Much of the difference can be accounted for by the higher rates of heart disease in the United States than in Canada. For men and women aged 45 to 64, the rates of death from heart disease are 31 and 64 percent higher in the United States than in Canada (tables C-1 1 and C-12).

AGES 65 AND OLDER

U.S. and Canadian death rates are comparable for males in this age group, but U.S. rates are about 12 percent higher than Canadian rates for females (tables C-13 and C-14). Much of this difference is explained by the higher rates of death from heart disease in the United States.

SUMMARY

The United States ranks relatively poorly among industrialized countries when general

mortality measures are used as indicators. Age at death is reliably reported in developed countries, and the age-specific death rate is a useful mortality measure for international comparisons. Compared to the age-specific death rates of other developed countries, U.S. rates are among the highest through the age of 64, and then are somewhat lower after the age of 65. These trends generally remain the same when the other countries' death rates are compared with the death rates of only the white residents of the United States. The high rates of death for members of younger age groups mean relatively low life expectancies at birth, and many years of potential life lost. An analysis of age-specific death rates since 1955 shows that the U.S. rates have been persistently high and that reductions in mortality have generally not been as great in the United States as those observed in comparison countries. An important exception to this trend is that mortality rates have declined significantly for U.S. men aged 45 to 54. The United States has made the least progress, however, in reducing mortality rates for men aged 25 to 34.

For people below the age of 35, accidents and injuries are major causes of death, and the U.S. rates of death from accidents and injuries are among the highest for a developed country. The rate of death from homicide and other violence is at least twice as high for the under-35 age group in the United States as in any of the comparison countries. After the age of 35, cancer and heart disease are the major causes of death in all the developed countries. U.S. rates of death from heart disease for both men and women aged 35 to 65 are among the highest, but U.S. rates of death from cancer are not exceptionally high compared with those of other developed countries.

If U.S. age-specific death rates were the same as the Canadian rates, the United States would have 9 percent fewer deaths (i.e., 192,200 U.S. deaths would have been avoided in 1989). Most of such excess deaths are concentrated in the 45 to 64 age group. Lower rates of heart disease in Canada than in the United States account for most of the disparities in the death rates for these age groups.