

## Deaths: Preliminary Data for 1999

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### Abstract

**Objectives**—This report presents preliminary data for 1999 on deaths in the United States. U.S. data on deaths are shown by age, sex, race, and Hispanic origin. Data on life expectancy, leading causes of death, and infant mortality are also presented.

**Methods**—Data in this report are based on a sample of deaths comprising more than 99 percent of the total deaths in the United States for 1999. The records are weighted to independent control counts of infant deaths, and deaths 1 year and over received in State vital statistics offices for 1999. Unless indicated, comparisons are made with final data for 1998. Effective with this report, all age-adjusted death rates for 1999 and earlier years are standardized to the year 2000 population. Also, effective with mortality data for 1999, causes of death are coded and classified according to the Tenth Revision of the International Classification of Diseases (ICD-10) replacing ICD-9 used in the United States for deaths occurring during 1979-98.

**Results**—In 1999 the age-adjusted death rate for the United States increased slightly, compared with 1998. For causes of death, declines in age-adjusted rates occurred for homicide (6 percent) and suicide (6 percent), while rates for Septicemia and hypertension increased 6.6 percent and 5.0 percent, respectively. Mortality also decreased for drug-induced deaths and deaths from injury by firearms. The infant mortality rate for the white population was down 3 rate for the black population increased by 2 percent, was not statistically significant. Life expectancy remained 76.7 years.

**Keywords:** deaths • vital statistics

### Introduction

This report presents preliminary data on deaths substantial proportion of vital records occurring previous reports in the preliminary series have births and deaths, this report, the eighth in the series, data on deaths; preliminary 1999 natality data separately (1). This report shows preliminary death data for 1999.

Trends shown in preliminary reports for 1995-98 deaths, for most measures, were confirmed by final statistics for each year (2-5).

### Sources and methods

#### Data sources

The preliminary data in this series are based on records of deaths that occurred during 1999 and were received and processed by the National Center for Health Statistics (NCHS) as of January 3, 2001. This represents over 99 percent of the deaths that occurred in the United States during the year. Demographic information was available for 100 percent of infant deaths (under 1 year of age) and 100 percent of deaths to persons aged 1 year and older. For these death records, medical or cause-of-death information was processed separately for 99 percent of infant deaths and 99 percent of deaths to persons aged 1 year and older.

To produce the preliminary estimates shown in this report, records were weighted using independent control counts of infant deaths and deaths 1 year and over received in the State vital statistics offices for 1999. Two separate sets of weights were applied to the death

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records—one set for the demographic information and one set for the medical information. This results in slight inconsistencies between comparable demographic data from the mortality demographic and medical tables (see section on Nature and sources of data in [Technical notes](#)). Preliminary estimates are subject to sampling variation as well as random variation.

Cause of death is not always available when the preliminary data are sent to NCHS, but is available later for final data processing. As a result, estimates based on preliminary mortality data may differ from statistics from the final mortality data. In particular, sampling bias may affect certain causes of death where the cause is pending investigation, such as for homicide, suicide, unintentional injuries, Human immunodeficiency virus (HIV) disease, and Sudden infant death syndrome. Because the preliminary file for 1999 is based on a virtually complete count, sampling biases may be considered nonexistent in comparisons with other years.

In addition to national and State estimates of total deaths and death rates, this report includes preliminary statistics on life expectancy, infant mortality, and causes of death. Race and Hispanic origin are reported as separate items on the death certificate. Therefore, data shown by race may be of Hispanic or non-Hispanic origin, and data for Hispanic origin may be of any race. Data are shown for the following race and ethnic groups: white, non-Hispanic white, black, American Indian, Asian or Pacific Islander (API), and Hispanic. Data for race and ethnic groups are based on the race and ethnic group reported for the decedent. Death rates for American Indian, API, and to a lesser extent, for Hispanics are known to be too low because of reporting problems (see section on Race and Hispanic origin in [Technical notes](#)).

The proportion of records processed is shown by State in [table I](#) in the [Technical notes](#). Changes in death rates between 1998 and 1999 and differences in death rates across demographic groups for 1999 were tested for statistical significance. Unless otherwise specified, reported differences in death rates are statistically significant. Detailed information on the nature, sources, and qualifications of the preliminary data is in the [Technical notes](#).

## Age-adjusted death rates

Because age-adjusted death rates in this report are based on a different standard population than in the previous reports, the magnitude of the rates is different. The new standard population for age-adjusting death rates is based on the estimated year 2000 population and, beginning with this report (1999 data), replaces the former standard based on the 1940 population (6). All age-adjusted death rates in this report use the new population standard (for further discussion, see section on Computing rates in [Technical notes](#)).

For analysis purposes, age-adjusted death rates by cause of death for 1999 are compared with the “comparability-modified” 1998 age-adjusted death rates (see section below). The comparability-modified rates are comparable quantitatively to the 1999 rates. Differences between the rates represent estimates of the true changes that occurred between 1998 and 1999, taking into account the break in comparability resulting from implementing the Tenth Revision of the ICD.

## Introduction to the Tenth Revision (ICD–10)

Effective with data for 1999, causes of death are classified by the *Tenth Revision International Classification of Diseases* (ICD–10)

(7), replacing the Ninth Revision (ICD–9) (8) used during 1979–98. This change has had several consequences: 1) new cause-of-death titles and corresponding cause-of-death codes; 2) breaks in comparability of cause-of-death statistics; and 3) restructuring of the leading causes of death.

Cause-of-death titles in ICD–10 differ in some cases from those in ICD–9. A comparison of cause-of-death titles for the 15 leading causes of death between ICD–9 and ICD–10 is shown in [table A](#). For 7 of the 15 leading causes of death the titles between ICD–9 and ICD–10 are the same.

Breaks in the comparability of some cause-of-death statistics have resulted from changes in category titles and from coding rules used to select the underlying cause of death. Measures of comparison—the “comparability ratio”—for the causes of death shown in this report are published in a companion report (9) and are reproduced in [tables II](#) and [III](#) in the [Technical notes](#). Comparisons between 1998 and 1999 cause-of-death data are based on the use of comparable ICD–10 codes for each cause-of-death category in 1998 (for further discussion see section on Comparability between ICD–9 and ICD–10 for mortality in [Technical notes](#)).

For 2 of the 15 leading causes of death (Alzheimer’s disease and kidney disease) caution must be exercised in interpreting differences in mortality between 1998 and 1999 data due to possible underestimates of comparability ratios (for additional information, see section on Selected causes of death with problems of interpretation in [Technical notes](#)). For three other leading causes of death major breaks occurred in comparability as a result of coding changes between ICD–9 and ICD–10 ([table II](#)): Septicemia had 19 percent more deaths assigned under ICD–10 than under ICD–9; hypertension, 12 percent more; and Influenza and pneumonia, 30 percent fewer. Lesser discontinuities occurred for three additional leading causes of death. Stroke had an estimated 6 percent more deaths; Chronic lower respiratory diseases, 5 percent more; and Chronic liver disease and cirrhosis, 4 percent more. For the remaining 7 of the 15 leading causes of death, little or no change occurred in the number of deaths assigned using the different coding revisions.

The 10 leading causes of infant death were affected by the introduction of ICD–10. A comparison of cause-of-death titles for the 10 leading causes of infant death between ICD–9 and ICD–10 are shown in [table B](#). For 4 of the 10 leading causes of infant death, the titles between ICD–9 and ICD–10 are the same.

## Results

### Trends in numbers and rates

The **preliminary number of deaths** in the United States for 1999 totaled 2,391,630, an increase of 54,374 from the 1998 total. The **crude death rate** increased from 864.7 per 100,000 population in 1998 to 877.0 per 100,000 in 1999. The two influenza outbreaks of 1999 contributed to the large increase in the number of deaths (10–12), especially among the older age groups and for several chronic diseases. The estimated **age-adjusted death rate**, which accounts for changes in the age distribution of the population, was 881.9 per 100,000 U.S. standard population, 1 percent higher than the 1998 rate of 875.8. Age-adjusted death rates are better indicators than crude death rates for showing changes in the risk of death over

**Table A. List of ICD-10 leading causes of death for 1999 and comparable ICD-9 causes of death**

ICD-10	ICD-9
Diseases of heart (I00–I09,I11,I13,I20–I51) (heart disease) . . . . .	Diseases of heart (390–398,402,404,410–429) (heart disease)
Malignant neoplasms (C00–C97) (cancer) . . . . .	Malignant neoplasms, including neoplasms of lymphatic and hematopoietic tissues (140–208) (cancer)
Cerebrovascular diseases (I60–I69) (stroke) . . . . .	Cerebrovascular diseases (430–434,436–438) <sup>1</sup> (stroke)
Chronic lower respiratory diseases (J40–J47) . . . . .	Chronic obstructive pulmonary diseases and allied conditions (490–494,496) <sup>1</sup> (COPD)
Accidents (V01–X59,Y85–Y86) (unintentional injuries) . . . . .	Accidents (E800–E869,E880–E929) <sup>1</sup> (accidents)
Diabetes mellitus (E10–E14) (diabetes) . . . . .	Diabetes mellitus (250) (diabetes)
Influenza and pneumonia (J10–J18) . . . . .	Pneumonia and influenza (480–487)
Alzheimer's disease (G30) . . . . .	Alzheimer's disease (331.0)
Nephritis, nephrotic syndrome and nephrosis (N00–N07,N17–N19,N25–N27) (kidney disease) . . . . .	Nephritis, nephrotic syndrome and nephrosis (580–589) (kidney disease)
Septicemia (A40–A41) . . . . .	Septicemia (038)
Intentional self-harm (X60–X84,Y87.0) (suicide) . . . . .	Suicide (E950–E959)
Chronic liver disease and cirrhosis (K70,K73–K74) . . . . .	Chronic liver disease and cirrhosis (571)
Essential (primary) hypertension and hypertensive renal disease (I10,I12) (hypertension) . . . . .	Hypertension with or without renal disease (401,403) (hypertension)
Assault (X85–Y09,Y87.1) (homicide) . . . . .	Homicide (E960–E969) <sup>1</sup>
Aortic aneurysm and dissection (I71) (aortic aneurysm) . . . . .	Aortic aneurysm (441) <sup>2</sup>

<sup>1</sup>ICD-9 codes do not match those of the ICD-9 List of 72 Selected Causes of Death; see Technical notes.

<sup>2</sup>Not a rankable cause in ICD-9; see Technical notes.

**Table B. List of ICD-10 leading causes of infant death for 1999 and comparable ICD-9 causes of infant death**

ICD-10	ICD-9
Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99) (congenital malformations) . . . . .	Congenital anomalies (740–759)
Disorders related to short gestation and low birth weight, not elsewhere classified (P07) (low birth weight) . . . . .	Disorders relating to short gestation and unspecified low birthweight (765) (low birthweight)
Sudden infant death syndrome (R95) (SIDS) . . . . .	Sudden infant death syndrome (798.0) (SIDS)
Newborn affected by maternal complications of pregnancy (P01) (maternal complications) . . . . .	Newborn affected by maternal complications of pregnancy (761) (maternal complications)
Respiratory distress of newborn (P22) . . . . .	Respiratory distress syndrome (769) (RDS)
Newborn affected by complications of placenta, cord and membranes (P02) (complications of placenta) . . . . .	Newborn affected by complications of placenta, cord and membranes (762) (complications of placenta)
Accidents (V01–X59) (unintentional injuries) . . . . .	Accidents (E800–E869,E880–E929) <sup>1</sup>
Bacterial sepsis of newborn (P36) (sepsis) . . . . .	Other infection specific to the perinatal period (771.8) <sup>2</sup>
Diseases of the circulatory system (I00–I99) . . . . .	Diseases of the circulatory system (390–434,436–459) <sup>2</sup>
Atelectasis (P28.0–P28.1) . . . . .	Primary, other and unspecified atelectasis (770.4–770.5) <sup>2</sup>

<sup>1</sup>ICD-9 codes do not match those of the ICD-9 List of 61 Selected Causes of Infant Death; see Technical notes.

<sup>2</sup>Not a rankable cause in ICD-9; see Technical notes.

time when the age distribution of the population is changing and for comparing the mortality of subgroups of the population that have different age compositions (table C).

The increase in the age-adjusted death rate between 1998 and 1999 halts the decreasing trend since 1994 and reflects increases in mortality for females but not for males. For American Indian females, age-adjusted death rates increased by 4.5 percent, for Hispanic females by 2.5 percent, for black females by 1.8 percent, for non-Hispanic white females by 1.5 percent, and for white females by 1.5 percent. Changes in mortality for Asian or Pacific Islander (API) females were not statistically significant, nor for any of the race and Hispanic origin groups of males (table 1).

Increases in mortality for all ages combined between 1998 and 1999 resulted from increases in the death rate for **age groups** 45–54 years, 75–84 years, and 85 years and over. These increases were partially offset by decreases for ages under 1 year, 5–14 years, 55–64 years, and 65–74 years. The declines for age groups between 15–44 years were not statistically significant.

Preliminary estimates of **life expectancy** at birth in 1999 for the total population remained the same as in 1998, 76.7 years (tables C and 6). This reflects the offsetting trends for males whose life expectancy increased by 0.1 years to a record 73.9 years, and for females whose life expectancy decreased by 0.1 years to 79.4 years. Record high life expectancies were reached for white and black males (74.6 years and 67.8 years, respectively). Life expectancies for white and black females decreased by 0.1 year, to 79.9 and 74.7 years, respectively.

### Causes of death

The list of 15 leading causes of death changed between 1998 and 1999. Fourteen of the 15 leading causes of death are on both lists for 1998 and 1999. Atherosclerosis (the 14th leading cause of death in 1998) dropped from the list and aortic aneurysm (not a rankable cause in 1998) debuted as the 15th leading cause of death. Among the leading causes, the rank order changed somewhat

**Table C. Deaths, age-adjusted death rates, and life expectancy at birth, by race and sex; and infant deaths and mortality rates, by race: United States, final 1998 and preliminary 1999**

Measure and sex	All races <sup>1</sup>		White		Black	
	1999	1998	1999	1998	1999	1998
All deaths . . . . .	2,391,630	2,337,256	2,061,531	2,015,984	285,091	278,440
Age-adjusted death rate <sup>2</sup> . . . . .	881.9	875.8	860.8	854.7	1,147.2	1,135.7
Male . . . . .	1,061.9	1,064.6	1,035.8	1,038.5	1,412.7	1,410.6
Female . . . . .	743.7	732.7	725.8	715.1	955.0	938.2
Life expectancy at birth <sup>3</sup> . . . . .	76.7	76.7	77.3	77.3	71.4	71.3
Male . . . . .	73.9	73.8	74.6	74.5	67.8	67.6
Female . . . . .	79.4	79.5	79.9	80.0	74.7	74.8
All infant deaths . . . . .	27,953	28,371	18,069	18,561	8,832	8,726
Infant mortality rate <sup>4</sup> . . . . .	7.1	7.2	5.8	6.0	14.6	14.3

<sup>1</sup>Includes races other than white and black.

<sup>2</sup>Age-adjusted death rates are per 100,000 U.S. standard population, based on the year 2000 standard; see Technical notes.

<sup>3</sup>Life expectancy at birth stated in years.

<sup>4</sup>Infant mortality rates are deaths under 1 year per 1,000 live births in specified group.

between the 2 years, reflecting in part changes in the coding rules of selecting the underlying cause of death between ICD-9 and ICD-10 (see section on Cause of death classification in [Technical notes](#)). Diabetes switched rank with Influenza and pneumonia, from 7th to 6th, largely due to ICD-10 coding changes. Alzheimer's disease rose from 12th to 8th, also largely due to ICD-10 coding changes; and suicide dropped from 8th to 11th. Septicemia rose from 11th to 10th; while Chronic liver disease and cirrhosis dropped from 10th to 12th. Hypertension rose from 15th to 13th and homicide dropped from 13th to 14th. In order, the 15 leading causes in 1999 were 1) heart disease, 2) cancer, 3) stroke, 4) Chronic lower respiratory diseases, 5) unintentional injuries, 6) diabetes, 7) Influenza and pneumonia, 8) Alzheimer's disease, 9) kidney disease, 10) Septicemia, 11) suicide, 12) Chronic liver disease and cirrhosis, 13) hypertension, 14) homicide, and 15) aortic aneurysm.

Reductions in mortality occurred for a number of the leading causes of death. From 1998 to 1999, the preliminary age-adjusted death rate for the leading cause of death, **heart disease**, decreased by 0.7 percent, while the age-adjusted death rate for **cancer** decreased by 0.9 percent ([tables D and 2](#)). Deaths from these two diseases combined accounted for more than 1.2 million deaths, more than one-half of all deaths that occurred in 1999. While heart disease mortality has exhibited a downward trend since 1950, cancer mortality has declined only since 1990.

The preliminary age-adjusted death rate decreased for **homicide** by 6 percent, continuing the downward trend since 1991. For black and white populations most age groups shared in the reduction of mortality from this cause. Homicide remained the leading cause of death for black males 15-24 years of age, the second leading cause for black females 15-24 years, and the third leading cause for black males 25-44 years. **Suicide** decreased by 6 percent with most race and sex groups participating in the decline. Suicide remained second for white males aged 15-24 years and third for those aged 25-44 years. Suicide was the third leading cause for white females 15-24 years of age. The decline in mortality for homicide and suicide continued the downward trend reported in final data for 1996, 1997, and 1998 (2-4). **Unintentional injuries** decreased by 1 percent continuing the general downward trend since the 1980's.

Between 1998 and 1999 the age-adjusted death rate for **aortic aneurysm** decreased by 4.9 percent. Decreases also occurred for

**Influenza and pneumonia** (2.9 percent), **stroke** (2.1 percent), and **Chronic liver disease and cirrhosis** (2.0 percent). Increases occurred for **Septicemia** (6.6 percent), **hypertension** (5.0 percent), **Chronic lower respiratory diseases** (3.9 percent), and **diabetes** (3.3 percent). Changes in mortality for Alzheimer's disease and kidney disease are not believed to be reliable (see section on Selected causes of death with problems of interpretation in [Technical notes](#)).

The preliminary age-adjusted death rate for Human immunodeficiency virus disease (**HIV disease**) decreased by 3.6 percent from 1998 to 1999. The rate decreased 28.8 percent from 1995 to 1996, 47.7 percent from 1996 to 1997, and 20.6 percent from 1997 to 1998. In 1995 the rate for HIV disease was not significantly different from 1994. From 1987 until 1994 HIV disease mortality increased an average of 16 percent annually. For the age group 25-44 years, this cause is still the 5th leading cause of death for males and females of all races combined; the leading cause of death for black men, the 3d for black women, and the 5th for white men in this age group.

During 1999 preliminary age-adjusted death rates decreased for **drug-induced deaths** (10.5 percent) and **firearm injuries** (6.2 percent). The rate for **alcohol-induced causes** and for **injuries at work** did not change between the 2 years ([table 2](#)).

Among the major race and Hispanic origin groups for 1999, the lowest mortality was reported for the Asian and Pacific Islander (API) and Hispanic populations whose preliminary age-adjusted death rates were 40 percent and 31 percent lower, respectively, than those for the non-Hispanic white population. In contrast, the age-adjusted death rate for the black population was 32 percent higher than that for the non-Hispanic white population. Mortality for races other than white and black and Hispanic origin may be seriously understated due to underreporting of race and Hispanic origin on death certificates and to undercounts of those population groups in the census (13-14).

The preliminary **infant mortality rate** for 1999 was 7.1 infant deaths per 1,000 live births, compared with the rate of 7.2 in 1998, a change that was not statistically significant ([tables C and 4](#)). Decreases occurred in infant mortality for the white and non-Hispanic white groups (both from 6.0 infant deaths per 1,000 live births to 5.8), while the changes for Hispanics (from 5.9 to 5.8) and blacks (from 14.3 to 14.6) were not statistically significant. Because of inconsistencies in reporting some race groups and Hispanic origin on birth and death certificates, infant mortality rates for these groups are likely to be underestimated

**Table D. Deaths, death rates, and age-adjusted death rates for 1999 and percent changes in age-adjusted rates from comparability-modified 1998 to 1999 for the 15 leading causes of death: United States, final 1998, comparability-modified 1998, and preliminary 1999**

[Data are based on a continuous file of records received from the States. Rates per 100,000 population; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Rank <sup>1</sup>	Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Number	Death rate	Percent of total deaths	Age-adjusted death rate			Percent change <sup>3</sup>
					1999	Comparability-modified <sup>2</sup> 1998	1998	
...	All causes . . . . .	2,391,630	877.0	100.0	881.9	875.8	875.8	0.7
1	Diseases of heart . . . . .	724,915	265.8	30.3	267.7	269.7	272.4	-0.7
2	Malignant neoplasms . . . . .	549,787	201.6	23.0	202.6	204.4	202.4	-0.9
3	Cerebrovascular diseases. . . . .	167,340	61.4	7.0	61.8	63.1	59.5	-2.1
4	Chronic lower respiratory diseases . . . . .	124,153	45.5	5.2	45.8	44.1	42.0	3.9
5	Accidents (unintentional injuries). . . . .	97,298	35.7	4.1	35.7	36.1	35.0	-1.1
	Motor vehicle accidents . . . . .	42,437	15.6	1.8	15.5	15.7	16.1	-3.1
	All other accidents . . . . .	54,862	20.1	2.3	20.1	---	---	---
6	Diabetes mellitus . . . . .	68,379	25.1	2.9	25.2	24.4	24.2	3.3
7	Influenza and pneumonia . . . . .	63,686	23.4	2.7	23.5	24.2	34.6	-2.9
8	Alzheimer's disease . . . . .	44,507	16.3	1.9	16.5	13.3	8.6	24.1
9	Nephritis, nephrotic syndrome, and nephrosis . . . . .	35,524	13.0	1.5	13.1	12.1	9.8	8.3
10	Septicemia . . . . .	30,670	11.2	1.3	11.3	10.6	8.9	6.6
11	Intentional self-harm (suicide) . . . . .	29,041	10.6	1.2	10.6	11.3	11.3	-6.2
12	Chronic liver disease and cirrhosis . . . . .	26,225	9.6	1.1	9.7	9.9	9.5	-2.0
13	Essential (primary) hypertension and hypertensive renal disease. . . . .	16,964	6.2	0.7	6.3	6.0	5.4	5.0
14	Assault (homicide) . . . . .	16,831	6.2	0.7	6.1	6.5	6.5	-6.2
15	Aortic aneurysm and dissection . . . . .	15,806	5.8	0.7	5.8	6.1	6.1	-4.9
...	All other causes. . . . .	380,503	139.5	15.9	---	---	---	---

... Category not applicable.

--- Data not available.

<sup>1</sup>Rank based on number of deaths; see Technical notes.

<sup>2</sup>Age-adjusted rate modified with the comparability ratios shown in Table II of the Technical notes.

<sup>3</sup>Percent change between the comparability-modified 1998 age-adjusted death rate and 1999 age-adjusted death rate.

(13–14). The linked birth/infant death data set (linked file) provides a better source of data for infant deaths and mortality rates by race and ethnicity (15).

The infant mortality rate for the leading cause of infant mortality, **congenital malformations**, which accounted for 19.6 percent of all infant deaths, decreased by 3.6 percent from 1998 to 1999 (table 5). The rate for **low birth weight**, the second leading cause of death for all infants (accounting for 15.7 percent of infant deaths), was 111.1 infant deaths per 1,000 live births in 1999 compared with 115.4 in 1998, but the change was not significant. While deaths due to SIDS have been declining since 1988 (2), the sharp downturn of 12.3 percent in 1999 in the infant mortality rate for SIDS is likely to represent a change in the way SIDS is diagnosed by the medical community. The decline in SIDS was accompanied by an increase in the number of deaths for Other symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (table 5) (see section on Selected causes of death with problems of interpretation in [Technical notes](#)).

By place of residence, **Hawaii** had the lowest mortality, with an age-adjusted death rate of 680.3 deaths per 100,000 U.S. standard population. Mortality was the highest for the **District of Columbia**, with an age-adjusted death rate of 1,083.1 (table 3); however, inasmuch as the District of Columbia is a metropolitan area, its rates are not comparable with those of States. The State with the next highest rate was Mississippi with a rate of 1,064.9 (table 3).

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## List of detailed tables

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**Table 1. Deaths and death rates by age, sex, and race and Hispanic origin and age-adjusted death rates, by sex and race and Hispanic origin: United States, final 1998 and preliminary 1999**

[Data are based on a continuous file of records received from the States. Age-specific rates per 100,000 population in specified group; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. The number of deaths and death rates for Hispanic origin and specified races other than white and black should be interpreted with caution because of inconsistencies between reporting Hispanic origin and race on death certificates and censuses and surveys; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Age, race, and sex	1999		1998	
	Number	Rate	Number	Rate
All races, both sexes				
All ages .....	2,391,630	877.0	2,337,256	864.7
Under 1 year <sup>1</sup> .....	27,953	731.8	28,371	751.3
1-4 years .....	5,250	34.7	5,251	34.6
5-14 years .....	7,595	19.2	7,791	19.9
15-24 years .....	30,664	81.2	30,627	82.3
25-34 years .....	41,070	108.3	42,516	109.6
35-44 years .....	89,273	199.2	88,866	199.6
45-54 years .....	152,997	427.3	146,479	423.5
55-64 years .....	239,007	1,021.9	233,724	1,030.7
65-74 years .....	452,636	2,484.5	458,982	2,495.1
75-84 years .....	698,648	5,751.8	681,663	5,703.2
85 years and over .....	646,181	15,477.1	612,575	15,111.7
Not stated .....	356	...	411	...
Age-adjusted rate <sup>2</sup> .....	...	881.9	...	875.8
All races, male				
All ages .....	1,175,549	882.0	1,157,260	876.4
Under 1 year <sup>1</sup> .....	15,656	802.0	15,786	818.2
1-4 years .....	2,976	38.5	2,920	37.6
5-14 years .....	4,492	22.2	4,686	23.4
15-24 years .....	22,419	116.0	22,717	119.3
25-34 years .....	28,281	150.2	29,215	151.7
35-44 years .....	57,128	256.7	57,139	258.5
45-54 years .....	95,677	546.8	91,727	542.8
55-64 years .....	142,744	1,280.2	140,134	1,296.9
65-74 years .....	254,930	3,109.4	259,343	3,143.7
75-84 years .....	340,984	7,000.1	334,212	7,019.2
85 years and over .....	209,985	16,931.0	199,057	16,763.3
Not stated .....	277	...	324	...
Age-adjusted rate <sup>2</sup> .....	...	1,061.9	...	1,064.6
All races, female				
All ages .....	1,216,081	872.3	1,179,996	853.5
Under 1 year <sup>1</sup> .....	12,297	658.4	12,585	681.3
1-4 years .....	2,274	30.8	2,331	31.4
5-14 years .....	3,103	16.1	3,105	16.2
15-24 years .....	8,245	44.7	7,910	43.5
25-34 years .....	12,789	66.9	13,301	68.1
35-44 years .....	32,145	142.5	31,727	141.5
45-54 years .....	57,320	313.2	54,752	309.6
55-64 years .....	96,263	786.5	93,590	788.4
65-74 years .....	197,706	1,973.2	199,639	1,967.7
75-84 years .....	357,664	4,916.0	347,451	4,831.9
85 years and over .....	436,196	14,862.7	413,518	14,427.4
Not stated .....	79	...	87	...
Age-adjusted rate <sup>2</sup> .....	...	743.7	...	732.7

See footnotes at end of table.

**Table 1. Deaths and death rates by age, sex, and race and Hispanic origin and age-adjusted death rates, by sex and race and Hispanic origin: United States, final 1998 and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Age-specific rates per 100,000 population in specified group; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. The number of deaths and death rates for Hispanic origin and specified races other than white and black should be interpreted with caution because of inconsistencies between reporting Hispanic origin and race on death certificates and censuses and surveys; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Age, race, and sex	1999		1998	
	Number	Rate	Number	Rate
White, total <sup>3</sup> , both sexes				
All ages .....	2,061,531	917.8	2,015,984	904.0
Under 1 year <sup>1</sup> .....	18,069	596.9	18,561	620.1
1-4 years .....	3,692	30.7	3,628	30.1
5-14 years .....	5,494	17.7	5,613	18.2
15-24 years .....	22,360	74.5	22,296	75.4
25-34 years .....	29,402	96.6	30,080	96.4
35-44 years .....	65,614	177.6	65,347	177.6
45-54 years .....	117,025	386.9	112,156	382.7
55-64 years .....	193,602	961.6	189,312	969.5
65-74 years .....	387,468	2,428.0	394,664	2,441.8
75-84 years .....	626,543	5,713.7	612,181	5,670.5
85 years and over .....	591,993	15,689.1	561,836	15,326.3
Not stated .....	269	...	310	...
Age-adjusted rate <sup>2</sup> .....	...	860.8	...	854.7
White <sup>3</sup> , male				
All ages .....	1,005,386	911.2	990,190	904.4
Under 1 year <sup>1</sup> .....	10,202	658.5	10,327	673.8
1-4 years .....	2,086	33.9	2,010	32.5
5-14 years .....	3,229	20.3	3,353	21.2
15-24 years .....	16,206	105.0	16,379	107.6
25-34 years .....	20,551	134.6	20,987	133.9
35-44 years .....	42,916	231.5	42,967	232.7
45-54 years .....	73,917	494.3	70,912	489.6
55-64 years .....	116,548	1,200.3	114,411	1,215.5
65-74 years .....	3,043.3	3,043.3	225,304	3,082.3
75-84 years .....	307,461	6,965.3	301,593	6,988.5
85 years and over .....	191,605	17,201.6	181,696	17,048.3
Not stated .....	212	...	251	...
Age-adjusted rate <sup>2</sup> .....	...	1,035.8	...	1,038.5
White <sup>3</sup> , female				
All ages .....	1,056,145	924.2	1,025,794	903.7
Under 1 year <sup>1</sup> .....	7,867	532.3	8,234	563.6
1-4 years .....	1,606	27.4	1,618	27.5
5-14 years .....	2,265	14.9	2,260	15.0
15-24 years .....	6,154	42.2	5,917	41.2
25-34 years .....	8,851	58.4	9,093	58.5
35-44 years .....	22,698	123.3	22,380	122.0
45-54 years .....	43,108	281.8	41,244	278.3
55-64 years .....	77,054	739.2	74,901	740.6
65-74 years .....	167,015	1,916.4	169,360	1,912.9
75-84 years .....	319,082	4,870.4	310,588	4,792.7
85 years and over .....	400,388	15,055.7	380,140	14,620.4
Not stated .....	57	...	59	...
Age-adjusted rate <sup>2</sup> .....	...	725.8	...	715.1

See footnotes at end of table.



**Table 1. Deaths and death rates by age, sex, and race and Hispanic origin and age-adjusted death rates, by sex and race and Hispanic origin: United States, final 1998 and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Age-specific rates per 100,000 population in specified group; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. The number of deaths and death rates for Hispanic origin and specified races other than white and black should be interpreted with caution because of inconsistencies between reporting Hispanic origin and race on death certificates and censuses and surveys; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Age, race, and sex	1999		1998	
	Number	Rate	Number	Rate
White, non-Hispanic, both sexes				
All ages .....	1,953,351	996.4	1,912,802	978.7
Under 1 year <sup>1</sup> .....	13,555	572.7	14,105	599.4
1-4 years .....	2,820	29.7	2,826	29.4
5-14 years .....	4,488	17.5	4,631	18.0
15-24 years .....	17,869	71.4	17,901	72.3
25-34 years .....	23,986	93.4	24,751	93.4
35-44 years .....	57,642	176.6	57,761	176.7
45-54 years .....	106,817	387.0	102,619	382.8
55-64 years .....	180,810	972.2	177,005	979.8
65-74 years .....	367,522	2,459.1	374,813	2,468.7
75-84 years .....	604,382	5,783.4	591,510	5,736.5
85 years and over .....	573,369	15,946.9	544,772	15,567.8
Not stated .....	91	...	108	...
Age-adjusted rate <sup>2</sup> .....	...	869.4	...	862.7
White, non-Hispanic, male				
All ages .....	944,960	984.7	931,844	974.7
Under 1 year <sup>1</sup> .....	7,722	636.8	7,857	651.5
1-4 years .....	1,606	33.0	1,563	31.8
5-14 years .....	2,643	20.1	2,769	21.0
15-24 years .....	12,678	98.7	12,855	101.2
25-34 years .....	16,450	128.4	16,954	128.1
35-44 years .....	37,298	228.2	37,569	229.7
45-54 years .....	67,162	491.7	64,630	487.2
55-64 years .....	108,704	1,208.1	106,896	1,224.0
65-74 years .....	209,165	3,077.8	214,004	3,112.5
75-84 years .....	296,531	7,057.5	291,285	7,072.8
85 years and over .....	184,934	17,538.7	175,389	17,363.4
Not stated .....	67	...	73	...
Age-adjusted rate <sup>2</sup> .....	...	1,045.2	...	1,047.0
White, non-Hispanic, female				
All ages .....	1,008,391	1,007.5	980,958	982.5
Under 1 year <sup>1</sup> .....	5,833	505.4	6,248	544.6
1-4 years .....	1,214	26.2	1,263	27.0
5-14 years .....	1,845	14.8	1,862	14.9
15-24 years .....	5,191	42.6	5,046	41.9
25-34 years .....	7,536	58.6	7,797	58.7
35-44 years .....	20,344	124.8	20,192	123.7
45-54 years .....	39,655	284.5	37,989	280.5
55-64 years .....	72,106	751.0	70,109	751.3
65-74 years .....	158,357	1,943.2	160,809	1,935.8
75-84 years .....	307,851	4,926.7	300,225	4,847.8
85 years and over .....	388,435	15,286.4	369,383	14,839.2
Not stated .....	24	...	35	...
Age-adjusted rate <sup>2</sup> .....	...	734.9	...	723.8

See footnotes at end of table.

**Table 1. Deaths and death rates by age, sex, and race and Hispanic origin and age-adjusted death rates, by sex and race and Hispanic origin: United States, final 1998 and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Age-specific rates per 100,000 population in specified group; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. The number of deaths and death rates for Hispanic origin and specified races other than white and black should be interpreted with caution because of inconsistencies between reporting Hispanic origin and race on death certificates and censuses and surveys; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Age, race, and sex	1999		1998	
	Number	Rate	Number	Rate
<b>Black, total<sup>3</sup>, both sexes</b>				
All ages .....	285,091	817.8	278,440	808.7
Under 1 year <sup>1</sup> .....	8,832	1,552.8	8,726	1,556.2
1-4 years .....	1,309	58.8	1,397	61.6
5-14 years .....	1,789	28.7	1,815	29.4
15-24 years .....	7,065	123.1	7,159	126.5
25-34 years .....	10,117	191.4	10,804	201.9
35-44 years .....	21,048	372.4	21,005	377.8
45-54 years .....	31,767	808.6	30,265	808.9
55-64 years .....	39,472	1,683.2	38,813	1,704.2
65-74 years .....	56,124	3,343.7	55,607	3,338.1
75-84 years .....	61,205	6,884.1	59,415	6,745.7
85 years and over .....	46,283	14,787.0	43,341	14,155.8
Not stated .....	80	...	93	...
Age-adjusted rate <sup>2</sup> .....	...	1,147.2	...	1,135.7
<b>Black <sup>3</sup>, male</b>				
All ages .....	145,726	880.1	143,417	877.7
Under 1 year <sup>1</sup> .....	4,899	1,694.7	4,883	1,717.8
1-4 years .....	745	65.9	795	69.2
5-14 years .....	1,096	34.6	1,114	35.6
15-24 years .....	5,350	185.7	5,522	194.6
25-34 years .....	6,725	268.4	7,142	282.0
35-44 years .....	12,571	473.7	12,590	483.1
45-54 years .....	19,307	1,082.4	18,360	1,082.6
55-64 years .....	22,770	2,244.1	22,390	2,269.3
65-74 years .....	29,589	4,182.1	29,274	4,186.0
75-84 years .....	27,844	8,354.1	27,316	8,311.4
85 years and over .....	14,771	16,051.1	13,964	15,540.9
Not stated .....	59	...	67	...
Age-adjusted rate <sup>2</sup> .....	...	1,412.7	...	1,410.6
<b>Black <sup>3</sup>, female</b>				
All ages .....	139,365	761.4	135,023	746.4
Under 1 year <sup>1</sup> .....	3,933	1,406.2	3,843	1,390.1
1-4 years .....	564	51.4	602	53.9
5-14 years .....	693	22.6	701	23.1
15-24 years .....	1,715	60.0	1,637	58.0
25-34 years .....	3,392	122.0	3,662	130.0
35-44 years .....	8,477	282.7	8,415	284.9
45-54 years .....	12,460	580.9	11,905	582.0
55-64 years .....	16,702	1,255.4	16,423	1,272.2
65-74 years .....	26,535	2,732.8	26,333	2,724.6
75-84 years .....	33,361	6,002.5	32,099	5,813.8
85 years and over .....	31,512	14,260.6	29,377	13,580.5
Not stated .....	21	...	26	...
Age-adjusted rate <sup>2</sup> .....	...	955.0	...	938.2

See footnotes at end of table.

**Table 1. Deaths and death rates by age, sex, and race and Hispanic origin and age-adjusted death rates, by sex and race and Hispanic origin: United States, final 1998 and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Age-specific rates per 100,000 population in specified group; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. The number of deaths and death rates for Hispanic origin and specified races other than white and black should be interpreted with caution because of inconsistencies between reporting Hispanic origin and race on death certificates and censuses and surveys; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Age, race, and sex	1999		1998	
	Number	Rate	Number	Rate
American Indian, total <sup>3, 4</sup> , both sexes				
All ages .....	11,313	471.9	10,845	459.5
Under 1 year <sup>1</sup> .....	344	808.6	379	926.9
1-4 years .....	82	51.4	94	59.2
5-14 years .....	105	22.4	115	24.6
15-24 years .....	540	125.9	483	115.6
25-34 years .....	646	172.7	666	178.1
35-44 years .....	1,028	286.5	1,005	283.3
45-54 years .....	1,327	518.3	1,287	521.7
55-64 years .....	1,674	1,130.2	1,582	1,105.0
65-74 years .....	2,164	2,390.9	2,023	2,269.7
75-84 years .....	2,063	4,082.4	1,877	3,869.1
85 years and over .....	1,339	6,569.8	1,333	7,038.0
Not stated .....	1	...	1	...
Age-adjusted rate <sup>2</sup> .....	...	716.1	...	705.2
American Indian <sup>3, 4</sup> , male				
All ages .....	6,092	513.3	5,994	513.2
Under 1 year <sup>1</sup> .....	180	839.5	211	1,028.1
1-4 years .....	48	59.4	52	64.7
5-14 years .....	55	23.1	70	29.5
15-24 years .....	396	183.5	350	166.4
25-34 years .....	418	218.5	450	235.1
35-44 years .....	646	362.7	655	373.6
45-54 years .....	844	682.3	792	664.2
55-64 years .....	920	1,321.8	927	1,376.9
65-74 years .....	1,149	2,819.2	1,075	2,682.8
75-84 years .....	986	4,648.3	902	4,471.3
85 years and over .....	449	6,946.2	509	8,486.2
Not stated .....	1	...	1	...
Age-adjusted rate <sup>2</sup> .....	...	841.9	...	856.7
American Indian <sup>3, 4</sup> , female				
All ages .....	5,221	431.2	4,851	407.0
Under 1 year <sup>1</sup> .....	164	777.3	168	825.0
1-4 years .....	34	43.1	42	53.5
5-14 years .....	50	21.7	45	19.6
15-24 years .....	144	67.5	133	64.1
25-34 years .....	228	124.7	216	118.3
35-44 years .....	382	211.5	350	195.1
45-54 years .....	483	365.0	495	388.3
55-64 years .....	754	960.4	655	863.6
65-74 years .....	1,015	2,040.0	948	1,932.4
75-84 years .....	1,077	3,673.0	975	3,440.5
85 years and over .....	890	6,395.1	824	6,366.9
Not stated .....	-	...	-	...
Age-adjusted rate <sup>2</sup> .....	...	608.5	...	582.2

See footnotes at end of table.

**Table 1. Deaths and death rates by age, sex, and race and Hispanic origin and age-adjusted death rates, by sex and race and Hispanic origin: United States, final 1998 and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Age-specific rates per 100,000 population in specified group; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. The number of deaths and death rates for Hispanic origin and specified races other than white and black should be interpreted with caution because of inconsistencies between reporting Hispanic origin and race on death certificates and censuses and surveys; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Age, race, and sex	1999		1998	
	Number	Rate	Number	Rate
Asian or Pacific Islander, total <sup>3</sup> , both sexes				
All ages .....	33,695	311.4	31,987	304.4
Under 1 year <sup>1</sup> .....	708	390.3	705	388.8
1-4 years .....	167	23.2	132	18.7
5-14 years .....	207	12.2	248	15.1
15-24 years .....	699	44.0	689	44.4
25-34 years .....	905	49.1	966	52.6
35-44 years .....	1,583	85.3	1,509	83.8
45-54 years .....	2,878	210.3	2,771	214.4
55-64 years .....	4,259	558.8	4,017	550.7
65-74 years .....	6,880	1,402.3	6,688	1,400.7
75-84 years .....	8,837	3,660.1	8,190	3,609.1
85 years and over .....	6,566	9,593.9	6,065	9,673.4
Not stated .....	6	...	7	...
Age-adjusted rate <sup>2</sup> .....	...	517.7	...	516.8
Asian or Pacific Islander <sup>3</sup> , male				
All ages .....	18,345	353.0	17,659	349.8
Under 1 year <sup>1</sup> .....	375	406.6	365	397.0
1-4 years .....	97	26.6	63	17.6
5-14 years .....	112	12.8	149	17.6
15-24 years .....	467	58.7	466	59.9
25-34 years .....	587	68.5	636	74.4
35-44 years .....	995	112.8	927	108.2
45-54 years .....	1,609	252.4	1,663	276.2
55-64 years .....	2,506	703.8	2,406	709.3
65-74 years .....	3,739	1,809.4	3,690	1,838.7
75-84 years .....	4,693	4,580.6	4,401	4,534.8
85 years and over .....	3,160	11,336.3	2,888	11,178.6
Not stated .....	5	...	5	...
Age-adjusted rate <sup>2</sup> .....	...	640.9	...	642.3
Asian or Pacific Islander <sup>3</sup> , female				
All ages .....	15,350	272.9	14,328	262.5
Under 1 year <sup>1</sup> .....	333	373.4	340	380.2
1-4 years .....	70	19.7	69	19.9
5-14 years .....	95	11.5	99	12.4
15-24 years .....	232	29.2	223	28.8
25-34 years .....	318	32.2	330	33.7
35-44 years .....	588	60.4	582	61.6
45-54 years .....	1,269	173.6	1,108	160.5
55-64 years .....	1,753	431.6	1,611	412.9
65-74 years .....	3,141	1,106.1	2,998	1,083.1
75-84 years .....	4,144	2,981.6	3,789	2,917.4
85 years and over .....	3,406	8,396.6	3,177	8,618.4
Not stated .....	1	...	2	...
Age-adjusted rate <sup>2</sup> .....	...	424.2	...	420.4

See footnotes at end of table.

**Table 1. Deaths and death rates by age, sex, and race and Hispanic origin and age-adjusted death rates, by sex and race and Hispanic origin: United States, final 1998 and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Age-specific rates per 100,000 population in specified group; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. The number of deaths and death rates for Hispanic origin and specified races other than white and black should be interpreted with caution because of inconsistencies between reporting Hispanic origin and race on death certificates and censuses and surveys; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Age, race, and sex	1999		1998	
	Number	Rate	Number	Rate
Hispanic <sup>5</sup> , both sexes				
All ages .....	103,772	331.1	98,406	325.3
Under 1 year <sup>1</sup> .....	4,416	612.0	4,371	624.7
1-4 years .....	883	32.2	819	30.4
5-14 years .....	1,014	16.9	988	17.2
15-24 years .....	4,509	82.4	4,411	83.3
25-34 years .....	5,398	103.2	5,252	101.5
35-44 years .....	7,801	164.3	7,411	163.0
45-54 years .....	9,880	339.0	9,191	334.9
55-64 years .....	12,322	733.9	11,818	739.8
65-74 years .....	19,204	1,743.1	18,973	1,782.0
75-84 years .....	20,920	3,773.2	19,375	3,718.3
85 years and over .....	17,359	9,176.3	15,714	8,876.9
Not stated .....	66	...	83	...
Age-adjusted rate <sup>2</sup> .....	...	601.2	...	596.4
Hispanic <sup>5</sup> , male				
All ages .....	58,006	368.0	55,821	366.4
Under 1 year <sup>1</sup> .....	2,411	655.3	2,422	678.5
1-4 years .....	482	34.4	456	33.1
5-14 years .....	592	19.4	592	20.2
15-24 years .....	3,549	125.0	3,544	128.8
25-34 years .....	4,085	151.6	3,979	148.4
35-44 years .....	5,479	226.1	5,256	226.6
45-54 years .....	6,499	456.4	6,017	449.3
55-64 years .....	7,493	963.0	7,164	966.3
65-74 years .....	10,784	2,219.6	10,742	2,284.9
75-84 years .....	10,319	4,526.0	9,654	4,564.6
85 years and over .....	6,253	9,842.3	5,913	9,946.7
Not stated .....	60	...	82	...
Age-adjusted rate <sup>2</sup> .....	...	736.2	...	743.7
Hispanic <sup>5</sup> , female				
All ages .....	45,766	293.8	42,585	283.6
Under 1 year <sup>1</sup> .....	2,005	567.0	1,949	568.7
1-4 years .....	401	29.8	363	27.6
5-14 years .....	422	14.4	396	14.1
15-24 years .....	960	36.5	867	34.0
25-34 years .....	1,313	51.8	1,273	51.0
35-44 years .....	2,322	99.9	2,155	96.7
45-54 years .....	3,381	226.8	3,174	225.8
55-64 years .....	4,829	536.0	4,654	543.6
65-74 years .....	8,420	1,367.1	8,231	1,384.3
75-84 years .....	10,601	3,247.5	9,721	3,140.1
85 years and over .....	11,106	8,839.5	9,801	8,336.0
Not stated .....	6	...	1	...
Age-adjusted rate <sup>2</sup> .....	...	490.2	...	478.2

... Category not applicable.  
- Quantity zero.

<sup>1</sup> Death rates are based on population estimates; they differ from infant mortality rates, which are based on live births and are shown separately for "Under 1 year."

<sup>2</sup> For method of computation, see Technical notes.

<sup>3</sup> Race and Hispanic origin are reported separately on the death certificate. Data for persons of Hispanic origin included in the data for each race group, according to the decedent's reported race; see Technical notes.

<sup>4</sup> Includes deaths among Aleuts and Eskimos.

<sup>5</sup> Includes all persons of Hispanic origin of any race; see Technical notes.

NOTE: Data are subject to sampling and/or random variation. For information on the relative standard errors of the data and further discussion, see Technical notes.

**Table 2. Deaths, death rates, and age-adjusted death rates for 113 selected causes, Injury by firearms, Drug-induced deaths, Alcohol-induced deaths, and Injury at work: United States, final 1998, comparability-modified final 1998, and preliminary 1999**

[Data are based on a continuous file of records received from the States. Rates per 100,000 population; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. Figures for comparability-modified 1998 and 1999 are based on weighted data rounded to the nearest individual, so categories may not add to total or subtotals]

Cause of death (Based on the Tenth Revision, International Classification of Diseases, 1992)	1999			1998					
	Number	Rate	Age-adjusted rate	Comparability-modified <sup>1</sup>			Comparability-unmodified <sup>2</sup>		
				Number	Rate	Age-adjusted rate	Number	Rate	Age-adjusted rate
All causes .....	2,391,630	877.0	881.9	2,337,256	864.7	875.8	2,337,256	864.7	875.8
Salmonella infections (A01-A02) .....	37	0.0	0.0	30	0.0	0.0	37	0.0	0.0
Shigellosis and amebiasis (A03,A06) .....	10	*	*	---	---	---	8	*	*
Certain other intestinal infections (A04,A07-A09) .....	1,108	0.4	0.4	---	---	---	1,059	0.4	0.4
Tuberculosis (A16-A19) .....	3856	0.3	0.3	945	0.3	0.3	1,112	0.4	0.4
Respiratory tuberculosis (A16) .....	692	0.3	0.2	742	0.3	0.3	815	0.3	0.3
Other tuberculosis (A17-A19) .....	164	0.1	0.1	208	0.1	0.1	297	0.1	0.1
Whooping cough (A37) .....	7	*	*	---	---	---	5	*	*
Scarlet fever and erysipelas (A38,A46) .....	5	*	*	---	---	---	3	*	*
Meningococcal infection (A39) .....	225	0.1	0.1	234	0.1	0.1	234	0.1	0.1
Septicemia (A40-A41) .....	30,670	11.2	11.3	28,240	10.5	10.6	23,731	8.8	8.9
Syphilis (A50-A53) .....	33	0.0	0.0	29	0.0	0.0	45	0.0	0.0
Acute poliomyelitis (A80) .....	-	*	*	---	---	---	-	*	*
Arthropod-borne viral encephalitis (A83-A84,A85.2) .....	3	*	*	---	---	---	5	*	*
Measles (B05) .....	2	*	*	---	---	---	-	*	*
Viral hepatitis (B15-B19) .....	33,228	1.2	1.2	3,981	1.5	1.5	4,796	1.8	1.8
Human immunodeficiency virus (HIV) disease (B20-B24) .....	14,681	5.4	5.4	315,306	5.7	5.6	13,426	5.0	4.9
Malaria (B50-B54) .....	7	*	*	---	---	---	6	*	*
Other and unspecified infectious and parasitic diseases and their sequelae (A00,A05,A20-A36,A42-A44,A48-A49,A54-A79,A81-A82,A85.0-A85.1,A85.8,A86-B04, B06-B09,B25-B49,B55-B99) .....	39,088	3.3	3.3	6,657	2.4	2.5	6,052	2.2	2.3
Malignant neoplasms (C00-C97) .....	549,787	201.6	202.6	546,947	202.3	204.4	541,532	200.3	202.4
Malignant neoplasms of lip, oral cavity, and pharynx (C00-C14) .....	7,485	2.7	2.8	7,646	2.8	2.9	7,965	2.9	3.0
Malignant neoplasm of esophagus (C15) .....	11,913	4.4	4.4	11,765	4.4	4.4	11,765	4.4	4.4
Malignant neoplasm of stomach (C16) .....	12,708	4.7	4.7	13,089	4.8	4.8	12,959	4.8	4.8
Malignant neoplasms of colon, rectum and anus (C18-C21) .....	57,152	21.0	21.1	56,785	21.0	21.2	56,785	21.0	21.2
Malignant neoplasms of liver and intrahepatic bile ducts (C22) .....	12,382	4.5	4.6	11,886	4.4	4.4	12,381	4.6	4.6
Malignant neoplasm of pancreas (C25) .....	29,083	10.7	10.7	28,335	10.5	10.6	28,335	10.5	10.6
Malignant neoplasm of larynx (C32) .....	3,816	1.4	1.4	3,866	1.4	1.5	3,866	1.4	1.5
Malignant neoplasm of trachea, bronchus and lung (C33-C34) .....	152,176	55.8	56.0	151,470	56.1	56.4	154,561	57.2	57.6
Malignant melanoma of skin (C43) .....	7,214	2.6	2.7	7,208	2.6	2.7	7,431	2.7	2.8
Malignant neoplasm of breast (C50) .....	41,524	15.2	15.3	42,507	15.8	16.0	42,086	15.6	15.8
Malignant neoplasm of cervix uteri (C53) .....	4,204	1.5	1.6	4,297	1.6	1.6	4,340	1.6	1.6
Malignant neoplasms of corpus uteri and uterus, part unspecified (C54-C55) .....	6,461	2.4	2.4	6,614	2.5	2.5	6,421	2.4	2.4
Malignant neoplasm of ovary (C56) .....	13,618	5.0	5.0	13,391	5.0	5.0	13,391	5.0	5.0
Malignant neoplasm of prostate (C61) .....	31,696	11.6	11.7	32,525	12.0	12.2	32,203	11.9	12.1
Malignant neoplasms of kidney and renal pelvis (C64-C65) .....	11,115	4.1	4.1	11,484	4.2	4.3	11,484	4.2	4.3
Malignant neoplasm of bladder (C67) .....	11,912	4.4	4.4	11,757	4.3	4.4	11,757	4.3	4.4
Malignant neoplasms of meninges, brain and other parts of central nervous system (C70-C72) .....	12,767	4.7	4.7	12,287	4.6	4.6	12,667	4.7	4.7
Malignant neoplasms of lymphoid, hematopoietic and related tissue (C81-C96) .....	56,312	20.7	20.7	55,538	20.5	20.8	55,538	20.5	20.8
Hodgkin's disease (C81) .....	1,402	0.5	0.5	1,298	0.5	0.5	1,311	0.5	0.5
Non-Hodgkin's lymphoma (C82-C85) .....	22,799	8.4	8.4	23,073	8.5	8.6	23,544	8.7	8.8
Leukemia (C91-C95) .....	21,014	7.7	7.7	20,527	7.6	7.7	20,324	7.5	7.6
Multiple myeloma and immunoproliferative neoplasms (C88,C90) .....	11,014	4.0	4.1	10,773	4.0	4.1	10,359	3.8	3.9
Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue (C96) .....	83	0.0	0.0	---	---	---	---	---	---
All other and unspecified malignant neoplasms (C17,C23-C24,C26-C31,C37-C41,C44-C49,C51-C52,C57-C60,C62-C63,C66,C68-C69, C73-C80,C97) .....	66,246	24.3	24.4	62,825	23.3	23.5	55,597	20.6	20.8

See footnotes at end of table.

**Table 2. Deaths, death rates, and age-adjusted death rates for 113 selected causes, Injury by firearms, Drug-induced deaths, Alcohol-induced deaths, and Injury at work: United States, final 1998, comparability-modified final 1998, and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Rates per 100,000 population; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. Figures for comparability-modified 1998 and 1999 are based on weighted data rounded to the nearest individual, so categories may not add to total or subtotals]

Cause of death (Based on the Tenth Revision, International Classification of Diseases, 1992)	1999			1998					
	Number	Rate	Age-adjusted rate	Comparability-modified <sup>1</sup>			Comparability-unmodified <sup>2</sup>		
				Number	Rate	Age-adjusted rate	Number	Rate	Age-adjusted rate
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48) .....	13,221	4.8	4.9	13,248	4.8	5.0	7,933	2.9	3.0
Anemias (D50-D64) .....	4,496	1.6	1.6	4,362	1.6	1.6	4,544	1.7	1.7
Diabetes mellitus (E10-E14) .....	68,379	25.1	25.2	65,399	24.2	24.4	64,751	24.0	24.2
Nutritional deficiencies (E40-E64) .....	4,608	1.7	1.7	4,729	1.7	1.7	4,077	1.5	1.5
Malnutrition (E40-E46) .....	3,773	1.4	1.4	3,803	1.4	1.5	3,881	1.4	1.5
Other nutritional deficiencies (E50-E64) .....	835	0.3	0.3	<sup>3</sup> 1,215	0.6	0.6	196	0.1	0.1
Meningitis (G00,G03) .....	850	0.3	0.3	776	0.3	0.3	768	0.3	0.3
Parkinson's disease (G20-G21) .....	14,591	5.4	5.4	13,167	4.9	4.9	13,167	4.9	4.9
Alzheimer's disease (G30) .....	44,507	16.3	16.5	<sup>3</sup> 35,224	13.0	13.3	22,725	8.4	8.6
Major cardiovascular diseases (I00-I78) .....	949,998	348.4	350.8	940,159	347.8	353.4	940,159	347.8	353.4
Diseases of heart (I00-I09,I11,I13,I20-I51) .....	724,915	265.8	267.7	717,610	265.5	269.7	724,859	268.2	272.4
Acute rheumatic fever and chronic rheumatic heart disease (I00-I09) .....	3,676	1.3	1.4	3,929	1.5	1.5	4,792	1.8	1.8
Hypertensive heart disease (I11) .....	22,675	8.3	8.4	22,172	8.2	8.3	27,715	10.3	10.4
Hypertensive heart and renal disease (I13) .....	3,324	1.2	1.2	2,581	1.0	1.0	2,412	0.9	0.9
Ischemic heart disease (I20-I25) .....	529,544	194.2	195.6	526,617	194.8	197.9	526,617	194.8	197.9
Acute myocardial infarction (I21-I22) .....	199,440	73.1	73.6	201,515	74.5	75.6	203,551	75.3	76.4
Other acute ischemic heart diseases (I24) .....	3,229	1.2	1.2	2,936	1.1	1.1	2,907	1.1	1.1
Other forms of chronic ischemic heart disease (I20,I25) .....	326,875	119.9	120.7	323,361	119.6	121.6	320,159	118.4	120.4
Atherosclerotic cardiovascular disease, so described (I25.0) .....	71,846	26.3	26.5	70,115	25.9	26.4	66,776	24.7	25.1
All other forms of chronic ischemic heart disease (I20, I25.1-I25.9) .....	255,029	93.5	94.2	250,849	92.8	94.3	253,383	93.7	95.3
Other heart diseases (I26-I51) .....	165,696	60.8	61.2	158,423	58.6	59.6	163,323	60.4	61.4
Acute and subacute endocarditis (I33) .....	1,116	0.4	0.4	1,055	0.4	0.4	1,055	0.4	0.4
Diseases of pericardium and acute myocarditis (I30-I31,I40) .....	883	0.3	0.3	843	0.3	0.3	818	0.3	0.3
Heart failure (I50) .....	54,920	20.1	20.3	52,237	19.3	19.7	50,228	18.6	18.9
All other forms of heart disease (I26-I28,I34-I38,I42-I49,I51) .....	108,777	39.9	40.1	104,549	38.6	39.3	111,222	41.1	41.8
Essential (primary) hypertension and hypertensive renal disease (I10,I12) .....	16,964	6.2	6.3	16,025	5.9	6.0	14,308	5.3	5.4
Cerebrovascular diseases (I60-I69) .....	167,340	61.4	61.8	167,525	62.0	63.1	158,042	58.5	59.5
Atherosclerosis (I70) .....	14,977	5.5	5.5	14,668	5.5	5.6	15,279	5.7	5.8
Other diseases of circulatory system (I71-I78) .....	25,801	9.5	9.5	26,287	9.7	9.9	27,671	10.2	10.4
Aortic aneurysm and dissection (I71) .....	15,806	5.8	5.8	16,237	6.0	6.1	16,237	6.0	6.1
Other diseases of arteries, arterioles and capillaries (I72-I78) .....	9,994	3.7	3.7	9,719	3.6	3.7	11,434	4.2	4.3
Other disorders of circulatory system (I80-I99) .....	4,022	1.5	1.5	4,529	1.6	1.6	4,397	1.6	1.6
Influenza and pneumonia (J10-J18) .....	63,686	23.4	23.5	64,310	23.8	24.2	91,871	34.0	34.6
Influenza (J10-J11) .....	1,663	0.6	0.6	1,741	0.6	0.6	1,724	0.6	0.6
Pneumonia (J12-J18) .....	62,023	22.7	22.9	63,103	23.4	23.8	90,147	33.4	34.0
Other acute lower respiratory infections (J20-J22) .....	538	0.2	0.2	438	0.2	0.2	452	0.2	0.2
Acute bronchitis and bronchiolitis (J20-J21) .....	386	0.1	0.1	339	0.2	0.2	452	0.2	0.2
Unspecified acute lower respiratory infection (J22) .....	152	0.1	0.1	---	---	---	---	---	---
Chronic lower respiratory diseases (J40-J47) .....	124,153	45.5	45.8	118,187	43.7	44.1	112,559	41.6	42.0
Bronchitis, chronic and unspecified (J40-J42) .....	1,171	0.4	0.4	1,182	0.4	0.4	3,032	1.1	1.1
Emphysema (J43) .....	17,776	6.5	6.5	17,028	6.3	6.3	17,555	6.5	6.5
Asthma (J45-J46) .....	4,650	1.7	1.7	4,840	1.8	1.8	5,438	2.0	2.0
Other chronic lower respiratory diseases (J44,J47) .....	100,556	36.9	37.0	95,187	35.2	35.5	86,534	32.0	32.3
Pneumoconioses and chemical effects (J60-J66,J68) .....	1,111	0.4	0.4	1,140	0.4	0.4	1,118	0.4	0.4
Pneumonitis due to solids and liquids (J69) .....	15,265	5.6	5.6	14,195	5.3	5.4	12,674	4.7	4.8
Other diseases of respiratory system (J00-J06,J30-J39,J67,J70-J98) .....	25,011	9.2	9.2	23,786	8.8	8.9	20,330	7.5	7.6
Peptic ulcer (K25-K28) .....	4,602	1.7	1.7	4,600	1.7	1.7	4,742	1.8	1.8
Diseases of appendix (K35-K38) .....	390	0.1	0.1	452	0.2	0.2	439	0.2	0.2
Hernia (K40-K46) .....	1,463	0.5	0.5	1,445	0.5	0.5	1,389	0.5	0.5
Chronic liver disease and cirrhosis (K70,K73-K74) .....	26,225	9.6	9.7	26,200	9.7	9.9	25,192	9.3	9.5

See footnotes at end of table.

**Table 2. Deaths, death rates, and age-adjusted death rates for 113 selected causes, Injury by firearms, Drug-induced deaths, Alcohol-induced deaths, and Injury at work: United States, final 1998, comparability-modified final 1998, and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Rates per 100,000 population; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. Figures for comparability-modified 1998 and 1999 are based on weighted data rounded to the nearest individual, so categories may not add to total or subtotals]

Cause of death (Based on the Tenth Revision, International Classification of Diseases, 1992)	1999			1998					
	Number	Rate	Age-adjusted rate	Comparability-modified <sup>1</sup>			Comparability-unmodified <sup>2</sup>		
				Number	Rate	Age-adjusted rate	Number	Rate	Age-adjusted rate
Alcoholic liver disease (K70) .....	11,941	4.4	4.4	12,034	4.5	4.5	11,798	4.4	4.4
Other chronic liver disease and cirrhosis (K73-K74) .....	14,283	5.2	5.3	14,064	5.3	5.3	13,394	5.0	5.0
Cholelithiasis and other disorders of gallbladder (K80-K82) .....	2,829	1.0	1.0	2,709	1.0	1.1	2,822	1.0	1.1
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27) .....	35,524	13.0	13.1	<sup>3</sup> 32,204	11.9	12.1	26,182	9.7	9.8
Acute and rapidly progressive nephritic and nephrotic syndrome (N00-N01,N04) .....	182	0.1	0.1	211	0.1	0.1	325	0.1	0.1
Chronic glomerulonephritis, nephritis and nephropathy, not specified as acute or chronic, and renal sclerosis, unspecified (N02-N03,N05-N07,N26) .....	588	0.2	0.2	669	0.2	0.2	1,715	0.6	0.6
Renal failure (N17-N19) .....	34,719	12.7	12.8	<sup>3</sup> 31,103	11.5	11.6	24,111	8.9	9.0
Other disorders of kidney (N25,N27) .....	35	0.0	0.0	28	0.0	0.0	31	0.0	0.0
Infections of kidney (N10-N12,N13.6,N15.1) .....	844	0.3	0.3	836	0.3	0.3	828	0.3	0.3
Hyperplasia of prostate (N40) .....	429	0.2	0.2	410	0.2	0.2	410	0.2	0.2
Inflammatory diseases of female pelvic organs (N70-N76) .....	108	0.0	0.0	99	0.0	0.0	101	0.0	0.0
Pregnancy, childbirth and the puerperium (O00-O99) .....	<sup>3</sup> 399	0.1	0.2	---	---	---	281	0.1	0.1
Pregnancy with abortive outcome (O00-O07) .....	30	0.0	0.0	---	---	---	32	0.0	0.0
Other complications of pregnancy, childbirth and the puerperium (O10-O99) .....	369	0.1	0.1	---	---	---	249	0.1	0.1
Certain conditions originating in the perinatal period (P00-P96) .....	14,275	5.2	5.1	14,368	5.4	5.2	13,428	5.0	4.9
Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	10,362	3.8	3.8	10,144	3.7	3.7	11,934	4.4	4.4
Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99) .....	<sup>3</sup> 28,445	10.4	10.4	24,952	9.2	9.3	25,992	9.6	9.7
All other diseases (Residual) .....	171,382	62.8	63.3	161,546	59.8	60.8	179,495	66.4	67.5
Accidents (unintentional injuries) (V01-X59,Y85-Y86) .....	97,298	35.7	35.7	97,161	35.9	36.1	94,331	34.9	35.0
Transport accidents (V01-V99,Y85) .....	46,378	17.0	17.0	46,086	17.1	17.0	46,086	17.1	17.0
Motor vehicle accidents (V02-V04,V09.0,V09.2,V12-V14,V19.0-V19.2,V19.4-V19.6,V20-V79,V80.3-V80.5,V81.0-V81.1,V82.0-V82.1,V83-V86,V87.0-V87.8,V88.0-V88.8,V89.0,V89.2) .....	<sup>3</sup> 42,437	15.6	15.5	42,431	15.7	15.7	43,501	16.1	16.1
Other land transport accidents (V01,V05-V06,V09.1,V09.3-V09.9,V10-V11,V15-V18,V19.3,V19.8-V19.9,V80.0-V80.2,V80.6-V80.9,V81.2-V81.9,V82.2-V82.9,V87.9,V88.9,V89.1,V89.3,V89.9) .....	<sup>3</sup> 2,042	0.7	0.7	---	---	---	750	0.3	0.3
Water, air and space, and other and unspecified transport accidents and their sequelae (V90-V99,Y85) .....	1,899	0.7	0.7	1,853	0.7	0.7	1,835	0.7	0.7
Nontransport accidents (W00-X59,Y86) .....	50,921	18.7	18.7	52,105	19.2	19.3	48,245	17.8	17.9
Falls (W00-W19) .....	13,125	4.8	4.8	13,670	5.0	5.1	16,274	6.0	6.1
Accidental discharge of firearms (W32-W34) .....	832	0.3	0.3	918	0.3	0.3	866	0.3	0.3
Accidental drowning and submersion (W65-W74) .....	3,513	1.3	1.3	3,964	1.5	1.4	3,964	1.5	1.4
Accidental exposure to smoke, fire and flames (X00-X09) .....	3,338	1.2	1.2	3,157	1.2	1.2	3,255	1.2	1.2
Accidental poisoning and exposure to noxious substances (X40-X49) .....	11,758	4.3	4.3	---	---	---	10,808	4.0	4.0
Other and unspecified nontransport accidents and their sequelae (W20-W31,W35-W64,W75-W99,X10-X39,X50-X59,Y86) .....	18,354	6.7	6.8	18,571	6.8	7.0	13,078	4.8	4.9
Intentional self-harm (suicide) (X60-X84,Y87.0) .....	29,041	10.6	10.6	30,575	11.3	11.3	30,575	11.3	11.3
Intentional self-harm (suicide) by discharge of firearms (X72-X74) .....	16,573	6.1	6.1	17,424	6.4	6.5	17,424	6.4	6.5
Intentional self-harm (suicide) by other and unspecified means and their sequelae (X60-X71,X75-X84,Y87.0) .....	12,468	4.6	4.6	13,151	4.9	4.9	13,151	4.9	4.9
Assault (homicide) (X85-Y09,Y87.1) .....	16,831	6.2	6.1	17,893	6.6	6.5	17,893	6.6	6.5
Assault (homicide) by discharge of firearms (X93-X95) .....	10,818	4.0	4.0	11,798	4.4	4.3	11,798	4.4	4.3
Assault (homicide) by other and unspecified means and their sequelae (X85-X92,X96-Y09,Y87.1) .....	6,013	2.2	2.2	6,095	2.3	2.2	6,095	2.3	2.2
Legal intervention (Y35,Y89.0) .....	394	0.1	0.2	---	---	---	379	0.1	0.1

See footnotes at end of table.



**Table 2. Deaths, death rates, and age-adjusted death rates for 113 selected causes, Injury by firearms, Drug-induced deaths, Alcohol-induced deaths, and Injury at work: United States, final 1998, comparability-modified final 1998, and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Rates per 100,000 population; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. Figures for comparability-modified 1998 and 1999 are based on weighted data rounded to the nearest individual, so categories may not add to total or subtotals]

Cause of death (Based on the Tenth Revision, International Classification of Diseases, 1992)	1999			1998					
	Number	Rate	Age-adjusted rate	Comparability-modified <sup>1</sup>			Comparability-unmodified <sup>2</sup>		
				Number	Rate	Age-adjusted rate	Number	Rate	Age-adjusted rate
Events of undetermined intent (Y10-Y34,Y87.2,Y89.9) .....	3,764	1.4	1.4	---	---	---	3,746	1.4	1.4
Discharge of firearms, undetermined intent (Y22-Y24) .....	320	0.1	0.1	---	---	---	316	0.1	0.1
Other and unspecified events of undetermined intent and their sequelae (Y10-Y21,Y25-Y34,Y87.2,Y89.9) .....	3,444	1.3	1.3	---	---	---	3,430	1.3	1.3
Operations of war and their sequelae (Y36,Y89.1) .....	23	0.0	0.0	---	---	---	17	*	*
Complications of medical and surgical care (Y40-Y84,Y88) .....	2,813	1.0	1.0	---	---	---	3,504	1.3	1.3
Injury by firearms <sup>4</sup> (W32-W34,X72-X74,X93-X95,Y22-Y24,Y35.0) .....	28,839	10.6	10.6	30,708	11.4	11.3	30,708	11.4	11.3
Drug-induced deaths <sup>4</sup> (F11.0-F11.5,F11.7-F11.9,F12.0-F12.5,F12.7-F12.9,F13.0-F13.5,F13.7-F13.9,F14.0-F14.5, F14.7-F14.9,F15.0-F15.5,F15.7-F15.9,F16.0-F16.5,F16.7-F16.9,F17.0,F17.3-F17.5, F17.7-F17.9,F18.0-F18.5,F18.7-F18.9,F19.0-F19.5,F19.7-F19.9,X40-X44,X60-X64,X85, Y10-Y14) .....	18,443	6.8	6.8	20,311	7.6	7.6	16,926	6.3	6.3
Alcohol-induced deaths <sup>4</sup> (F10,G31.2,G62.1,I42.6,K29.2,K70,R78.0,X45,X65,Y15) .....	19,086	7.0	7.1	18,930	7.0	7.1	19,515	7.2	7.3
Injury at work <sup>5</sup> .....	5,652	2.6	2.6	---	---	---	5,543	2.6	2.6

\* Figure does not meet standards of reliability or precision (see Technical notes).

--- Data not available.

- Quantity zero.

<sup>1</sup> Number, rate, and age-adjusted rate modified with the comparability ratios shown in Table II of Technical notes.

<sup>2</sup> ICD-9 codes that approximate ICD-10 categories are shown in Table II of Technical notes.

<sup>3</sup> For discussion of 1998-99 comparison, see Technical notes.

<sup>4</sup> Included in selected categories.

<sup>5</sup> Injury at work described in Technical notes.

NOTE: Data are subject to sampling and/or random variation. For information on the relative standard errors of the data and further discussion, see Technical notes.

**Table 3. Deaths, death rates, and age-adjusted death rates: United States, and each State and territory, final 1998 and preliminary 1999**

[By place of residence. Data are based on a continuous file of records received from the States. Rates per 100,000 population; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical notes. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Area	1999			1998		
	Number	Rate	Age-adjusted rate	Number	Rate	Age-adjusted rate
United States <sup>1</sup> .....	2,391,630	877.0	881.9	2,337,256	864.7	875.8
Alabama .....	44,806	1,025.3	1,021.1	43,950	1,009.9	1,009.1
Alaska .....	2,708	437.1	834.4	2,571	418.7	805.1
Arizona .....	40,050	838.2	850.1	38,300	820.4	835.8
Arkansas .....	27,927	1,094.6	1,005.5	27,510	1,083.8	993.0
California .....	229,381	692.1	791.0	226,954	694.8	797.7
Colorado .....	27,114	668.5	801.2	26,640	670.9	810.2
Connecticut .....	29,446	897.2	792.3	29,710	907.4	808.0
Delaware .....	6,666	884.6	904.6	6,578	884.6	920.2
District of Columbia .....	6,078	1,171.1	1,083.1	6,054	1,157.3	1,082.9
Florida .....	163,224	1,080.1	833.9	158,167	1,060.4	823.8
Georgia .....	62,028	796.4	983.9	60,428	790.7	978.7
Hawaii .....	8,270	697.6	680.3	8,091	678.2	688.8
Idaho .....	9,579	765.3	825.2	9,155	745.1	812.7
Illinois .....	108,444	894.1	903.2	104,480	867.4	882.8
Indiana .....	55,335	931.1	941.9	53,477	906.5	924.3
Iowa .....	28,413	990.2	815.3	28,362	990.8	817.9
Kansas .....	24,472	922.1	850.5	24,057	915.0	846.1
Kentucky .....	39,322	992.8	1,012.8	37,832	961.1	984.2
Louisiana .....	41,241	943.3	1,040.7	40,337	923.3	1,018.4
Maine .....	12,261	978.5	896.3	12,135	975.3	897.8
Maryland .....	43,091	833.2	911.2	42,059	819.1	907.1
Massachusetts .....	55,840	904.3	816.7	55,237	898.6	819.3
Michigan .....	87,233	884.4	906.9	85,160	867.5	898.6
Minnesota .....	38,538	807.0	792.2	37,195	787.1	776.4
Mississippi .....	28,185	1,018.0	1,064.9	27,847	1,011.8	1,062.5
Missouri .....	55,932	1,022.8	954.1	55,070	1,012.6	945.7
Montana .....	8,128	920.7	861.2	7,981	906.5	857.6
Nebraska .....	15,579	935.1	838.7	15,198	914.0	824.5
Nevada .....	15,086	833.8	967.3	14,464	828.0	970.2
New Hampshire .....	9,537	794.0	835.2	9,495	801.2	849.4
New Jersey .....	73,982	908.5	857.8	71,611	882.5	843.5
New Mexico .....	13,686	786.6	876.3	12,907	743.1	835.3
New York .....	159,930	878.9	836.0	156,619	861.7	830.3
North Carolina .....	69,600	909.7	943.6	67,993	901.0	940.5
North Dakota .....	6,103	963.1	802.6	5,920	927.5	791.1
Ohio .....	108,519	964.0	933.7	105,891	944.7	923.9
Oklahoma .....	34,702	1,033.4	985.1	33,929	1,013.8	970.4
Oregon .....	29,422	887.2	839.2	29,383	895.3	859.5
Pennsylvania .....	130,287	1,086.3	907.6	126,700	1,055.7	894.4
Rhode Island .....	9,708	979.8	812.8	9,604	971.6	819.1
South Carolina .....	36,053	927.8	996.0	34,827	907.9	976.6
South Dakota .....	6,953	948.4	820.2	6,867	930.3	815.1
Tennessee .....	53,766	980.5	1,001.9	53,415	983.6	1,008.1
Texas .....	146,994	733.4	893.0	142,605	721.7	881.6
Utah .....	12,058	566.1	787.1	11,824	563.1	784.8
Vermont .....	4,993	840.9	843.9	4,948	837.4	853.9
Virginia .....	55,320	804.9	905.9	54,446	801.7	907.3
Washington .....	43,865	762.0	816.1	42,706	750.6	814.2
West Virginia .....	21,061	1,165.6	1,013.9	20,767	1,146.6	1,006.8
Wisconsin .....	46,672	888.9	838.1	45,947	879.6	835.2
Wyoming .....	4,042	842.8	909.0	3,853	801.2	881.7
Puerto Rico <sup>2</sup> .....	28,967	744.7	895.5	29,861	774.2	934.3
Virgin Islands <sup>2</sup> .....	659	550.9	805.2	615	519.5	757.5
Guam <sup>2</sup> .....	693	456.0	832.9	632	423.9	763.9
American Samoa <sup>2</sup> .....	243	381.0	826.0	243	391.3	862.2
Northern Marianas <sup>2</sup> .....	158	228.3	1,010.7	162	243.2	1,010.0

<sup>1</sup> Excludes data for U.S. territories.

<sup>2</sup> Age-adjusted death rates for U.S. territories are calculated using different age groups in the weighting procedure; see Technical notes.

NOTE: Data are subject to sampling and/or random variation. For information on the relative standard errors of the data and further discussion, see Technical notes.

**Table 4. Infant deaths and infant mortality rates, by age and race and Hispanic origin: United States, final 1998 and preliminary 1999**

[Data are based on a continuous file of records received from the States. Rates per 1,000 live births. Figures for 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals. Rates for Hispanic origin should be interpreted with caution because of inconsistencies between reporting Hispanic origin on birth and death certificates; see Technical notes]

Age and race/Hispanic origin	1999		1998	
	Number	Rate	Number	Rate
All races <sup>1</sup>				
Under 1 year .....	27,953	7.1	28,371	7.2
Under 28 days .....	18,740	4.7	18,918	4.8
28 days-11 months .....	9,213	2.3	9,453	2.4
White, total <sup>2</sup>				
Under 1 year .....	18,069	5.8	18,561	6.0
Under 28 days .....	12,165	3.9	12,406	4.0
28 days-11 months .....	5,904	1.9	6,155	2.0
White, non-Hispanic				
Under 1 year .....	13,555	5.8	14,105	6.0
Under 28 days .....	9,056	3.9	9,315	3.9
28 days-11 months .....	4,499	1.9	4,790	2.0
Black, total <sup>2</sup>				
Under 1 year .....	8,832	14.6	8,726	14.3
Under 28 days .....	5,927	9.8	5,824	9.5
28 days-11 months .....	2,905	4.8	2,902	4.8
Hispanic <sup>3</sup>				
Under 1 year .....	4,416	5.8	4,371	5.9
Under 28 days .....	2,988	3.9	2,972	4.0
28 days-11 months .....	1,428	1.9	1,399	1.9

<sup>1</sup> Includes races other than white and black.

<sup>2</sup> Race and Hispanic origin are reported separately on both the birth and death certificates. Data for persons of Hispanic origin are included in the data for each race group, according to the decedent's reported race; see Technical notes.

<sup>3</sup> Includes all persons of Hispanic origin of any race; see Technical notes.

NOTE: Data are subject to sampling and/or random variation. For information on the relative standard errors of the data and further discussion, see Technical notes.

**Table 5. Infant deaths and infant mortality rates for 130 selected causes: United States, final 1998, comparability-modified final 1998, and preliminary 1999**

[Data are based on a continuous file of records received from the States. Rates per 100,000 live births. Figures for comparability-modified 1998 and 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals or subtotals]

Cause of death (Based on the Tenth Revision, International Classification of Diseases, 1992)	1999		1998			
	Number	Rate	Comparability-modified <sup>1</sup>		Comparability-unmodified <sup>2</sup>	
			Number	Rate	Number	Rate
All causes .....	27,953	706.3	28,371	719.8	28,371	719.8
Certain infectious and parasitic diseases (A00-B99) .....	558	14.1	546	13.9	748	19.0
Certain intestinal infectious diseases (A00-A08) .....	20	0.5	---	---	9	*
Diarrhea and gastroenteritis of infectious origin (A09) .....	3	*	---	---	221	5.6
Tuberculosis (A16-A19) .....	2	*	---	---	-	*
Tetanus (A33,A35) .....	-	*	---	---	-	*
Diphtheria (A36) .....	-	*	---	---	-	*
Whooping cough (A37) .....	7	*	---	---	4	*
Meningococcal infection (A39) .....	32	0.8	22	0.6	23	0.6
Septicemia (A40-A41) .....	281	7.1	298	7.6	216	5.5
Congenital syphilis (A50) .....	2	*	---	---	2	*
Gonococcal infection (A54) .....	-	*	---	---	-	*
Viral diseases (A80-B34) .....	134	3.4	112	2.8	112	2.8
Acute poliomyelitis (A80) .....	-	*	---	---	-	*
Varicella (chickenpox) (B01) .....	3	*	---	---	3	*
Measles (B05) .....	1	*	---	---	-	*
Human immunodeficiency virus (HIV) disease (B20-B24) .....	14	*	---	---	14	*
Mumps (B26) .....	-	*	---	---	-	*
Other and unspecified viral diseases (A81-B00,B02-B04,B06-B19,B25,B27-B34) .....	116	2.9	92	2.3	95	2.4
Candidiasis (B37) .....	27	0.7	---	---	40	1.0
Malaria (B50-B54) .....	1	*	---	---	-	*
Pneumocystosis (B59) .....	4	*	---	---	10	*
All other and unspecified infectious and parasitic diseases (A20-A32,A38,A42-A49,A51-A53,A55-A79,B35-B36,B38-B49,B55-B58,B60-B99) .....	47	1.2	---	---	111	2.8
Neoplasms (C00-D48) .....	125	3.2	139	3.5	138	3.5
Malignant neoplasms (C00-C97) .....	67	1.7	81	2.1	78	2.0
Hodgkin's disease and non-Hodgkin's lymphomas (C81-C85) .....	2	*	---	---	5	*
Leukemia (C91-C95) .....	27	0.7	---	---	19	*
Other and unspecified malignant neoplasms (C00-C80,C88,C90,C96-C97) .....	38	1.0	58	1.5	54	1.4
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48) .....	58	1.5	58	1.4	60	1.5
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89) .....	93	2.3	85	2.2	122	3.1
Anemias (D50-D64) .....	12	*	---	---	23	0.6
Hemorrhagic conditions and other diseases of blood and blood-forming organs (D65-D76) .....	63	1.6	---	---	71	1.8
Certain disorders involving the immune mechanism (D80-D89) .....	18	*	---	---	28	0.7
Endocrine, nutritional and metabolic diseases (E00-E88) .....	241	6.1	240	6.1	276	7.0
Short stature, not elsewhere classified (E34.3) .....	24	0.6	---	---	35	0.9
Nutritional deficiencies (E40-E64) .....	9	*	---	---	11	*
Cystic fibrosis (E84) .....	12	*	---	---	12	*
Volume depletion, disorders of fluid, electrolyte and acid-base balance (E86-E87) .....	53	1.3	70	1.8	93	2.4
All other endocrine, nutritional and metabolic diseases (E00-E32,E34.0-E34.2,E34.4-E34.9,E65-E83,E85,E88) .....	143	3.6	145	3.7	125	3.2
Diseases of the nervous system (G00-G98) .....	439	11.1	471	12.0	440	11.2
Meningitis (G00,G03) .....	116	2.9	107	2.7	107	2.7
Infantile spinal muscular atrophy, type I (Werdnig-Hoffman) (G12.0) .....	41	1.0	41	1.0	41	1.0
Infantile cerebral palsy (G80) .....	13	*	---	---	15	*
Anoxic brain damage, not elsewhere classified (G93.1) .....	35	0.9	42	1.1	43	1.1
Other diseases of nervous system (G04,G06-G11,G12.1-G12.9,G20-G72,G81-G92,G93.0,G93.2-G93.9,G95-G98) .....	234	5.9	269	6.8	234	5.9
Diseases of the ear and mastoid process (H60-H93) .....	4	*	---	---	5	*
Diseases of the circulatory system (I00-I99) .....	667	16.9	705	17.9	993	25.2
Pulmonary heart disease and diseases of pulmonary circulation (I26-I28) .....	219	5.5	205	5.2	183	4.6

See footnotes at end of table.

**Table 5. Infant deaths and infant mortality rates for 130 selected causes: United States, final 1998, comparability-modified final 1998, and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Rates per 100,000 live births. Figures for comparability-modified 1998 and 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals or subtotals]

Cause of death (Based on the Tenth Revision, International Classification of Diseases, 1992)	1999		1998			
	Number	Rate	Comparability-modified <sup>1</sup>		Comparability-unmodified <sup>2</sup>	
			Number	Rate	Number	Rate
Pericarditis, endocarditis and myocarditis (I30,I33,I40) .....	20	0.5	---	---	24	0.6
Cardiomyopathy (I42) .....	131	3.3	132	3.3	135	3.4
Cardiac arrest (I46) .....	27	0.7	31	0.8	107	2.7
Cerebrovascular diseases (I60-I69) .....	104	2.6	139	3.5	296	7.5
All other diseases of circulatory system (I00-I25,I31,I34-I38,I44-I45,I47-I51,I70-I99) .....	165	4.2	179	4.5	248	6.3
Diseases of the respiratory system (J00-J98) .....	673	17.0	663	16.8	818	20.8
Acute upper respiratory infections (J00-J06) .....	10	*	---	---	9	*
Influenza and pneumonia (J10-J18) .....	312	7.9	335	8.5	441	11.2
Influenza (J10-J11) .....	13	*	---	---	6	*
Pneumonia (J12-J18) .....	299	7.6	331	8.4	435	11.0
Acute bronchitis and acute bronchiolitis (J20-J21) .....	62	1.6	35	0.9	44	1.1
Bronchitis, chronic and unspecified (J40-J42) .....	19	*	---	---	27	0.7
Asthma (J45-J46) .....	5	*	---	---	7	*
Pneumonitis due to solids and liquids (J69) .....	15	*	---	---	11	*
Other and unspecified diseases of respiratory system (J22,J30-J39,J43-J44,J47-J68,J70-J98) .....	249	6.3	257	6.5	279	7.1
Diseases of the digestive system (K00-K92) .....	499	12.6	548	13.9	330	8.4
Gastritis, duodenitis, and noninfective enteritis and colitis (K29,K50-K55) .....	242	6.1	221	5.5	76	1.9
Hernia of abdominal cavity and intestinal obstruction without hernia (K40-K46,K56) .....	65	1.6	---	---	69	1.8
All other and unspecified diseases of digestive system (K00-K28,K30-K38,K57-K92) .....	191	4.8	181	4.6	185	4.7
Diseases of the genitourinary system (N00-N98) .....	191	4.8	161	4.1	161	4.1
Renal failure and other disorders of kidney (N17-N19,N25,N27) .....	163	4.1	131	3.3	126	3.2
Other and unspecified diseases of genitourinary system (N00-N15,N20-N23,N26,N28-N98) .....	28	0.7	---	---	35	0.9
Certain conditions originating in the perinatal period (P00-P96) .....	14,097	356.2	14,092	357.5	13,294	337.3
Newborn affected by maternal factors and by complications of pregnancy,labor and delivery (P00-P04) .....	2,741	69.3	2,630	66.7	2,553	64.8
Newborn affected by maternal hypertensive disorders (P00.0) .....	71	1.8	58	1.5	55	1.4
Newborn affected by other maternal conditions which may be unrelated to present pregnancy (P00.1-P00.9) .....	68	1.7	---	---	75	1.9
Newborn affected by maternal complications of pregnancy (P01) .....	1,402	35.4	1,383	35.1	1,343	34.1
Newborn affected by incompetent cervix (P01.0) .....	385	9.7	389	9.9	381	9.7
Newborn affected by premature rupture of membranes (P01.1) .....	648	16.4	635	16.1	623	15.8
Newborn affected by multiple pregnancy (P01.5) .....	225	5.7	256	6.5	253	6.4
Newborn affected by other maternal complications of pregnancy (P01.2-P01.4,P01.6-P01.9) .....	143	3.6	105	2.7	86	2.2
Newborn affected by complications of placenta, cord and membranes (P02) .....	1,025	25.9	1,009	25.6	961	24.4
Newborn affected by complications involving placenta (P02.0-P02.3) .....	532	13.4	554	14.0	518	13.1
Newborn affected by complications involving cord (P02.4-P02.6) .....	64	1.6	---	---	65	1.6
Newborn affected by chorioamnionitis (P02.7) .....	429	10.8	379	9.6	375	9.5
Newborn affected by other and unspecified abnormalities of membranes (P02.8-P02.9) .....	1	*	---	---	3	*
Newborn affected by other complications of labor and delivery (P03) .....	145	3.7	168	4.3	91	2.3
Newborn affected by noxious influences transmitted via placenta or breast milk (P04) .....	29	0.7	---	---	28	0.7
Disorders related to length of gestation and fetal malnutrition (P05-P08) .....	4,459	112.7	4,595	116.6	4,140	105.0
Slow fetal growth and fetal malnutrition (P05) .....	62	1.6	43	1.1	38	1.0
Disorders related to short gestation and low birth weight, not elsewhere classified (P07) .....	4,397	111.1	4,552	115.4	4,101	104.0
Extremely low birth weight or extreme immaturity (P07.0,P07.2) .....	3,327	84.1	3,439	87.2	3,098	78.6
Other low birth weight or preterm (P07.1,P07.3) .....	1,069	27.0	1,103	27.9	1,003	25.4
Disorders related to long gestation and high birth weight (P08) .....	-	*	---	---	1	*
Birth trauma (P10-P15) .....	20	0.5	38	*	194	4.9
Intrauterine hypoxia and birth asphyxia (P20-P21) .....	613	15.5	668	17.0	461	11.7
Intrauterine hypoxia (P20) .....	113	2.9	110	2.8	122	3.1
Birth asphyxia (P21) .....	500	12.6	546	13.8	339	8.6
Respiratory distress of newborn (P22) .....	1,111	28.1	1,334	33.9	1,295	32.9
Other respiratory conditions originating in the perinatal period (P23-P28) .....	1,722	43.5	3 <sup>1</sup> ,447	36.7	1,702	43.2

See footnotes at end of table.

**Table 5. Infant deaths and infant mortality rates for 130 selected causes: United States, final 1998, comparability-modified final 1998, and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Rates per 100,000 live births. Figures for comparability-modified 1998 and 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals or subtotals]

Cause of death (Based on the Tenth Revision, International Classification of Diseases, 1992)	1999		1998			
	Number	Rate	Comparability-modified <sup>1</sup>		Comparability-unmodified <sup>2</sup>	
			Number	Rate	Number	Rate
Congenital pneumonia (P23) .....	82	2.1	76	1.9	20	0.5
Neonatal aspiration syndromes (P24) .....	84	2.1	65	1.7	47	1.2
Interstitial emphysema and related conditions originating in the perinatal period (P25) .....	230	5.8	174	4.5	144	3.7
Pulmonary hemorrhage originating in the perinatal period (P26) .....	269	6.8	248	6.3	170	4.3
Chronic respiratory disease originating in the perinatal period (P27) .....	336	8.5	358	9.1	314	8.0
Atelectasis (P28.0-P28.1) .....	649	16.4	<sup>3</sup> 439	11.1	213	5.4
All other respiratory conditions originating in the perinatal period (P28.2-P28.9) .....	70	1.8	56	1.4	794	20.1
Infections specific to the perinatal period (P35-P39) .....	869	22.0	831	21.1	815	20.7
Bacterial sepsis of newborn (P36) .....	689	17.4	670	17.0	736	18.7
Omphalitis of newborn with or without mild hemorrhage (P38) .....	-	*	---	---	-	*
All other infections specific to the perinatal period (P35,P37,P39) .....	180	4.5	194	4.9	79	2.0
Hemorrhagic and hematological disorders of newborn (P50-P61) .....	620	15.7	643	16.3	453	11.5
Neonatal hemorrhage (P50-P52,P54) .....	508	12.8	481	12.2	334	8.5
Hemorrhagic disease of newborn (P53) .....	1	*	---	---	4	*
Hemolytic disease of newborn due to isoimmunization and other perinatal jaundice (P55-P59) .....	16	*	---	---	34	0.9
Hematological disorders (P60-P61) .....	95	2.4	---	---	81	2.1
Syndrome of infant of a diabetic mother and neonatal diabetes mellitus (P70.0-P70.2) .....	8	*	---	---	11	*
Necrotizing enterocolitis of newborn (P77) .....	405	10.2	423	10.7	344	8.7
Hydrops fetalis not due to hemolytic disease (P83.2) .....	189	4.8	161	4.1	161	4.1
Other perinatal conditions (P29,P70.3-P70.9,P71-P76,P78-P81,P83.0-P83.1,P83.3-P83.9,P90-P96) .....	1,342	33.9	1,328	33.7	1,165	29.6
Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	5,471	138.2	5,653	143.4	6,212	157.6
Anencephaly and similar malformations (Q00) .....	311	7.9	296	7.5	296	7.5
Congenital hydrocephalus (Q03) .....	93	2.3	83	2.1	122	3.1
Spina bifida (Q05) .....	22	0.6	31	0.8	41	1.0
Other congenital malformations of nervous system (Q01-Q02,Q04,Q06-Q07) .....	263	6.6	322	8.2	298	7.6
Congenital malformations of heart (Q20-Q24) .....	1,593	40.2	1,769	44.9	1,769	44.9
Other congenital malformations of circulatory system (Q25-Q28) .....	220	5.6	195	5.0	315	8.0
Congenital malformations of respiratory system (Q30-Q34) .....	564	14.3	599	15.2	950	24.1
Congenital malformations of digestive system (Q35-Q45) .....	93	2.3	---	---	104	2.6
Congenital malformations of genitourinary system (Q50-Q64) .....	366	9.2	342	8.6	364	9.2
Congenital malformations and deformations of musculoskeletal system, limbs and integument (Q65-Q85) .....	487	12.3	396	10.1	461	11.7
Down's syndrome (Q90) .....	94	2.4	119	3.0	121	3.1
Edward's syndrome (Q91.0-Q91.3) .....	440	11.1	384	9.7	384	9.7
Patau's syndrome (Q91.4-Q91.7) .....	250	6.3	280	7.2	286	7.3
Other congenital malformations and deformations (Q10-Q18,Q86-Q89) .....	508	12.8	533	13.5	549	13.9
Other chromosomal abnormalities, not elsewhere classified (Q92-Q99) .....	166	4.2	164	4.2	152	3.9
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99) .....	3,612	91.3	3,731	94.7	3,658	92.8
Sudden infant death syndrome (R95) .....	2,583	65.3	<sup>3</sup> 2,935	74.5	2,822	71.6
Other symptoms, signs and abnormal clinical and laboratory findings,not elsewhere classified (R00-R53,R55-R94,R96-R99) .....	1,029	26.0	761	19.3	836	21.2
All other diseases (Residual) .....	23	0.6	---	---	25	0.6
External causes of mortality (V01-Y84) .....	1,259	31.8	1,139	28.9	1,151	29.2
Accidents (unintentional injuries)(V01-X59) .....	833	21.0	734	18.7	720	18.3
Transport accidents (V01-V99) .....	188	4.8	151	3.9	164	4.2
Motor vehicle accidents (V02-V04,V09.0,V09.2,V12-V14,V19.0-V19.2,V19.4-V19.6,V20-V79,V80.3-V80.5,V81.0-V81.1,V82.0-V82.1,V83-V86,V87.0-V87.8,V88.0-V88.8,V89.0,V89.2) .....	183	4.6	157	4.0	162	4.1
Other and unspecified transport accidents (V01,V05-V06,V09.1,V09.3-V09.9,V10-V11,V15-V18,V19.3,V19.8-V19.9,V80.0-V80.2,V80.6-V80.9,V81.2-V81.9,V82.2-V82.9,V87.9,V88.9,V89.1,V89.3,V89.9,V90-V99) .....	5	*	---	---	2	*

See footnotes at end of table.

**Table 5. Infant deaths and infant mortality rates for 130 selected causes: United States, final 1998, comparability-modified final 1998, and preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Rates per 100,000 live births. Figures for comparability-modified 1998 and 1999 are based on weighted data rounded to the nearest individual, so categories may not add to totals or subtotals]

Cause of death (Based on the Tenth Revision, International Classification of Diseases, 1992)	1999		1998			
	Number	Rate	Comparability-modified <sup>1</sup>		Comparability-unmodified <sup>2</sup>	
			Number	Rate	Number	Rate
Falls (W00-W19) .....	12	*	---	---	20	0.5
Accidental discharge of firearms (W32-W34) .....	-	*	---	---	-	*
Accidental drowning and submersion (W65-W74) .....	67	1.7	---	---	62	1.6
Accidental suffocation and strangulation in bed (W75) .....	246	6.2	---	---	184	4.7
Other accidental suffocation and strangulation (W76-W77,W81-W84) .....	153	3.9	146	3.6	128	3.2
Accidental inhalation and ingestion of food or other objects causing obstruction of respiratory tract (W78-W80) .....	62	1.6	70	1.8	64	1.6
Accidents caused by exposure to smoke, fire and flames (X00-X09) .....	40	1.0	---	---	41	1.0
Accidental poisoning and exposure to noxious substances (X40-X49) .....	12	*	---	---	9	*
Other and unspecified accidents (W20-W31,W35-W64,W85-W99,X10-X39,X50-X59) .....	52	1.3	---	---	48	1.2
Assault (homicide) (X85-Y09) .....	323	8.2	305	7.7	321	8.1
Assault (homicide) by hanging, strangulation and suffocation (X91) .....	33	0.8	---	---	36	0.9
Assault (homicide) by discharge of firearms (X93-X95) .....	8	*	---	---	5	*
Neglect, abandonment and other maltreatment syndromes (Y06-Y07) .....	122	3.1	---	---	130	3.3
Assault (homicide) by other and unspecified means (X85-X90,X92,X96-X99,Y00-Y05,Y08-Y09) .....	160	4.0	155	3.9	150	3.8
Complications of medical and surgical care (Y40-Y84) .....	52	1.3	---	---	34	0.9
Other external causes (X60-X84,Y10-Y36) .....	50	1.3	---	---	76	1.9

--- Data not available.

\* Figure does not meet standards of reliability or precision (see Technical notes).

- Quantity zero.

<sup>1</sup> Number and rate modified with the comparability ratios shown in Table II of Technical notes.

<sup>2</sup> ICD-9 codes that approximate ICD-10 categories are shown in Table II of Technical notes.

<sup>3</sup> For discussion of 1998-99 comparison, see Technical notes.

NOTE: Data are subject to sampling and/or random variation. For information on the relative standard errors of the data and further discussion, see Technical notes.

**Table 6. Expectation of life by age, race, and sex: United States, final 1998 and preliminary 1999**

[Data are based on a continuous file of records received from the States]

Age (Years) and race	Both sexes		Male		Female	
	1999	1998	1999	1998	1999	1998
<b>All races <sup>1</sup></b>						
0 .....	76.7	76.7	73.9	73.8	79.4	79.5
1 .....	76.3	76.3	73.5	73.4	78.9	79.0
5 .....	72.4	72.4	69.6	69.5	75.0	75.1
10 .....	67.4	67.4	64.7	64.6	70.1	70.2
15 .....	62.5	62.5	59.7	59.7	65.1	65.2
20 .....	57.7	57.7	55.0	55.0	60.2	60.3
25 .....	53.0	53.0	50.4	50.3	55.4	55.5
30 .....	48.2	48.2	45.7	45.7	50.5	50.6
35 .....	43.5	43.5	41.0	41.0	45.7	45.8
40 .....	38.8	38.8	36.5	36.4	41.0	41.1
45 .....	34.2	34.3	32.0	31.9	36.3	36.4
50 .....	29.8	29.8	27.7	27.6	31.7	31.8
55 .....	25.5	25.5	23.5	23.5	27.3	27.4
60 .....	21.5	21.5	19.6	19.6	23.1	23.2
65 .....	17.7	17.8	16.0	16.0	19.1	19.2
70 .....	14.3	14.3	12.8	12.8	15.4	15.5
75 .....	11.2	11.3	9.9	10.0	12.1	12.2
80 .....	8.5	8.6	7.4	7.5	9.1	9.2
85 .....	6.2	6.3	5.5	5.5	6.6	6.7
90 .....	4.6	4.7	4.0	4.1	4.8	4.9
95 .....	3.4	3.5	3.0	3.0	3.5	3.6
100 .....	2.6	2.6	2.3	2.3	2.7	2.7
<b>White</b>						
0 .....	77.3	77.3	74.6	74.5	79.9	80.0
1 .....	76.8	76.8	74.1	74.0	79.3	79.4
5 .....	72.9	72.9	70.2	70.1	75.4	75.5
10 .....	67.9	67.9	65.3	65.2	70.5	70.6
15 .....	63.0	63.0	60.3	60.2	65.5	65.6
20 .....	58.2	58.2	55.6	55.5	60.6	60.8
25 .....	53.4	53.4	50.9	50.8	55.8	55.9
30 .....	48.6	48.6	46.2	46.1	50.9	51.0
35 .....	43.9	43.9	41.5	41.5	46.1	46.2
40 .....	39.2	39.2	36.9	36.8	41.3	41.4
45 .....	34.6	34.6	32.4	32.3	36.6	36.7
50 .....	30.1	30.1	28.0	27.9	31.9	32.0
55 .....	25.7	25.7	23.8	23.7	27.5	27.6
60 .....	21.6	21.6	19.8	19.7	23.2	23.3
65 .....	17.8	17.8	16.1	16.1	19.2	19.3
70 .....	14.3	14.4	12.9	12.8	15.5	15.6
75 .....	11.2	11.3	10.0	10.0	12.1	12.2
80 .....	8.5	8.5	7.5	7.5	9.0	9.1
85 .....	6.2	6.3	5.4	5.4	6.5	6.6
90 .....	4.5	4.5	4.0	4.0	4.7	4.7
95 .....	3.2	3.3	2.9	2.9	3.3	3.4
100 .....	2.3	2.4	2.2	2.2	2.4	2.4
<b>Black</b>						
0 .....	71.4	71.3	67.8	67.6	74.7	74.8
1 .....	71.5	71.4	67.9	67.7	74.7	74.8
5 .....	67.6	67.6	64.1	63.9	70.9	70.9
10 .....	62.7	62.6	59.2	59.0	66.0	66.0
15 .....	57.8	57.7	54.3	54.1	61.0	61.1
20 .....	53.1	53.0	49.6	49.5	56.2	56.2
25 .....	48.5	48.4	45.2	45.1	51.4	51.4
30 .....	43.9	43.8	40.7	40.6	46.6	46.7
35 .....	39.3	39.3	36.3	36.2	41.9	42.0
40 .....	34.8	34.9	31.9	31.9	37.4	37.5
45 .....	30.6	30.6	27.8	27.7	33.0	33.1
50 .....	26.6	26.6	24.0	23.9	28.7	28.8
55 .....	22.8	22.8	20.4	20.4	24.7	24.8
60 .....	19.3	19.3	17.2	17.1	20.9	21.0
65 .....	16.0	16.1	14.3	14.3	17.3	17.4
70 .....	13.0	13.0	11.6	11.5	14.0	14.1
75 .....	10.4	10.5	9.2	9.2	11.1	11.3
80 .....	8.1	8.2	7.2	7.1	8.6	8.7
85 .....	6.2	6.3	5.6	5.5	6.5	6.6
90 .....	4.8	4.8	4.4	4.3	4.8	4.9
95 .....	3.6	3.7	3.5	3.4	3.6	3.7
100 .....	2.8	2.8	2.8	2.7	2.7	2.8

<sup>1</sup> Includes races other than white and black.

NOTE: Data are subject to sampling and/or random variation.



**Table 7. Deaths and death rates for the 10 leading causes of death in specified age groups: United States, preliminary 1999**

[Data are based on a continuous file of records received from the States. Rates per 100,000 population in specified group. Figures are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Rank <sup>1</sup>	Cause of death and age (Based on Tenth Revision, International Classification of Diseases, 1992)	Number	Rate
All ages <sup>2</sup>			
...	All causes .....	2,391,630	877.0
1	Diseases of heart (I00-I09,I11,I13,I20-I51) .....	724,915	265.8
2	Malignant neoplasms (C00-C97) .....	549,787	201.6
3	Cerebrovascular diseases (I60-I69) .....	167,340	61.4
4	Chronic lower respiratory diseases (J40-J47) .....	124,153	45.5
5	Accidents (unintentional injuries) (V01-X59,Y85-Y86) .....	97,298	35.7
...	Motor vehicle accidents (V02-V04,V09.0,V09.2,V12-V14,V19.0-V19.2,V19.4-V19.6,V20-V79,V80.3-V80.5, V81.0-V81.1,V82.0-V82.1,V83-V86,V87.0-V87.8,V88.0-V88.8,V89.0,V89.2) .....	42,437	15.6
...	All other accidents (V01,V05-V06,V09.1,V09.3-V09.9,V10-V11,V15-V18,V19.3,V19.8-V19.9,V80.0-V80.2, V80.6-V80.9,V81.2-V81.9,V82.2-V82.9,V87.9,V88.9,V89.1,V89.3,V89.9,V90-V99,W00-X59,Y85,Y86) .....	54,862	20.1
6	Diabetes mellitus (E10-E14) .....	68,379	25.1
7	Influenza and pneumonia (J10-J18) .....	63,686	23.4
8	Alzheimer's disease (G30) .....	44,507	16.3
9	Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27) .....	35,524	13.0
10	Septicemia (A40-A41) .....	30,670	11.2
...	All other causes (Residual) .....	485,371	178.0
1-4 years			
...	All causes .....	5,249	34.7
1	Accidents (unintentional injuries) (V01-X59,Y85-Y86) .....	1,885	12.5
...	Motor vehicle accidents (V02-V04,V09.0,V09.2,V12-V14,V19.0-V19.2,V19.4-V19.6,V20-V79,V80.3-V80.5, V81.0-V81.1,V82.0-V82.1,V83-V86,V87.0-V87.8,V88.0-V88.8,V89.0,V89.2) .....	650	4.3
...	All other accidents (V01,V05-V06,V09.1,V09.3-V09.9,V10-V11,V15-V18,V19.3,V19.8-V19.9,V80.0-V80.2, V80.6-V80.9,V81.2-V81.9,V82.2-V82.9,V87.9,V88.9,V89.1,V89.3,V89.9,V90-V99,W00-X59,Y85,Y86) .....	1,235	8.2
2	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	547	3.6
3	Malignant neoplasms (C00-C97) .....	418	2.8
4	Assault (homicide) (X85-Y09,Y87.1) .....	371	2.5
5	Diseases of heart (I00-I09,I11,I13,I20-I51) .....	178	1.2
6	Influenza and pneumonia (J10-J18) .....	126	0.8
7	Certain conditions originating in the perinatal period (P00-P96) .....	94	0.6
8	Septicemia (A40-A41) .....	88	0.6
9	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48) .....	63	0.4
10	Chronic lower respiratory diseases (J40-J47) .....	54	0.4
...	All other causes (Residual) .....	1,425	9.4
5-14 years			
...	All causes .....	7,595	19.2
1	Accidents (unintentional injuries) (V01-X59,Y85-Y86) .....	3,088	7.8
...	Motor vehicle accidents (V02-V04,V09.0,V09.2,V12-V14,V19.0-V19.2,V19.4-V19.6,V20-V79,V80.3-V80.5, V81.0-V81.1,V82.0-V82.1,V83-V86,V87.0-V87.8,V88.0-V88.8,V89.0,V89.2) .....	1,773	4.5
...	All other accidents (V01,V05-V06,V09.1,V09.3-V09.9,V10-V11,V15-V18,V19.3,V19.8-V19.9,V80.0-V80.2, V80.6-V80.9,V81.2-V81.9,V82.2-V82.9,V87.9,V88.9,V89.1,V89.3,V89.9,V90-V99,W00-X59,Y85,Y86) .....	1,315	3.3
2	Malignant neoplasms (C00-C97) .....	1,012	2.6
3	Assault (homicide) (X85-Y09,Y87.1) .....	429	1.1
4	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	428	1.1
5	Diseases of heart (I00-I09,I11,I13,I20-I51) .....	274	0.7
6	Intentional self-harm (suicide) (X60-X84,Y87.0) .....	244	0.6
7	Chronic lower respiratory diseases (J40-J47) .....	139	0.4
8	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48) .....	101	0.3
9	Influenza and pneumonia (J10-J18) .....	93	0.2
10	Septicemia (A40-A41) .....	77	0.2
...	All other causes (Residual) .....	1,710	4.3
15-24 years			
...	All causes .....	30,660	81.2
1	Accidents (unintentional injuries) (V01-X59,Y85-Y86) .....	13,602	36.0
...	Motor vehicle accidents (V02-V04,V09.0,V09.2,V12-V14,V19.0-V19.2,V19.4-V19.6,V20-V79,V80.3-V80.5, V81.0-V81.1,V82.0-V82.1,V83-V86,V87.0-V87.8,V88.0-V88.8,V89.0,V89.2) .....	10,141	26.8
...	All other accidents (V01,V05-V06,V09.1,V09.3-V09.9,V10-V11,V15-V18,V19.3,V19.8-V19.9,V80.0-V80.2, V80.6-V80.9,V81.2-V81.9,V82.2-V82.9,V87.9,V88.9,V89.1,V89.3,V89.9,V90-V99,W00-X59,Y85,Y86) .....	3,461	9.2
2	Assault (homicide) (X85-Y09,Y87.1) .....	4,989	13.2
3	Intentional self-harm (suicide) (X60-X84,Y87.0) .....	3,885	10.3
4	Malignant neoplasms (C00-C97) .....	1,724	4.6
5	Diseases of heart (I00-I09,I11,I13,I20-I51) .....	1,048	2.8
6	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	430	1.1
7	Chronic lower respiratory diseases (J40-J47) .....	208	0.6
8	Human immunodeficiency virus (HIV) disease (B20-B24) .....	197	0.5
9	Cerebrovascular diseases (I60-I69) .....	182	0.5
10	Influenza and pneumonia (J10-J18) .....	176	0.5
...	All other causes (Residual) .....	4,219	11.2

See footnotes at end of table.

**Table 7. Deaths and death rates for the 10 leading causes of death in specified age groups: United States, preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Rates per 100,000 population in specified group. Figures are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Rank <sup>1</sup>	Cause of death and age (Based on Tenth Revision, International Classification of Diseases, 1992)	Number	Rate
25-44 years			
...	All causes .....	130,340	157.5
1	Accidents (unintentional injuries) (V01-X59, Y85-Y86) .....	26,836	32.4
...	Motor vehicle accidents (V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, V89.2) .....	13,531	16.4
...	All other accidents (V01, V05-V06, V09.1, V09.3-V09.9, V10-V11, V15-V18, V19.3, V19.8-V19.9, V80.0-V80.2, V80.6-V80.9, V81.2-V81.9, V82.2-V82.9, V87.9, V88.9, V89.1, V89.3, V89.9, V90-V99, W00-X59, Y85, Y86) .....	13,304	16.1
2	Malignant neoplasms (C00-C97) .....	20,734	25.1
3	Diseases of heart (I00-I09, I11, I13, I20-I51) .....	16,542	20.0
4	Intentional self-harm (suicide) (X60-X84, Y87.0) .....	11,496	13.9
5	Human immunodeficiency virus (HIV) disease (B20-B24) .....	8,905	10.8
6	Assault (homicide) (X85-Y09, Y87.1) .....	7,417	9.0
7	Chronic liver disease and cirrhosis (K70, K73-K74) .....	3,696	4.5
8	Cerebrovascular diseases (I60-I69) .....	3,147	3.8
9	Diabetes mellitus (E10-E14) .....	2,512	3.0
10	Influenza and pneumonia (J10-J18) .....	1,389	1.7
...	All other causes (Residual) .....	27,666	33.4
45-64 years			
...	All causes .....	391,994	662.2
1	Malignant neoplasms (C00-C97) .....	135,748	229.3
2	Diseases of heart (I00-I09, I11, I13, I20-I51) .....	99,035	167.3
3	Accidents (unintentional injuries) (V01-X59, Y85-Y86) .....	18,799	31.8
...	Motor vehicle accidents (V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, V89.2) .....	8,347	14.1
...	All other accidents (V01, V05-V06, V09.1, V09.3-V09.9, V10-V11, V15-V18, V19.3, V19.8-V19.9, V80.0-V80.2, V80.6-V80.9, V81.2-V81.9, V82.2-V82.9, V87.9, V88.9, V89.1, V89.3, V89.9, V90-V99, W00-X59, Y85, Y86) .....	10,451	17.7
4	Cerebrovascular diseases (I60-I69) .....	15,210	25.7
5	Chronic lower respiratory diseases (J40-J47) .....	14,395	24.3
6	Diabetes mellitus (E10-E14) .....	13,826	23.4
7	Chronic liver disease and cirrhosis (K70, K73-K74) .....	11,989	20.3
8	Intentional self-harm (suicide) (X60-X84, Y87.0) .....	7,924	13.4
9	Human immunodeficiency virus (HIV) disease (B20-B24) .....	4,992	8.4
10	Septicemia (A40-A41) .....	4,400	7.4
...	All other causes (Residual) .....	65,676	111.0
65 years and over			
...	All causes .....	1,797,451	5,204.0
1	Diseases of heart (I00-I09, I11, I13, I20-I51) .....	607,255	1,758.1
2	Malignant neoplasms (C00-C97) .....	390,070	1,129.3
3	Cerebrovascular diseases (I60-I69) .....	148,580	430.2
4	Chronic lower respiratory diseases (J40-J47) .....	108,106	313.0
5	Influenza and pneumonia (J10-J18) .....	57,270	165.8
6	Diabetes mellitus (E10-E14) .....	51,846	150.1
7	Alzheimer's disease (G30) .....	43,990	127.4
8	Accidents (unintentional injuries) (V01-X59, Y85-Y86) .....	32,147	93.1
...	Motor vehicle accidents (V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, V89.2) .....	7,779	22.5
...	All other accidents (V01, V05-V06, V09.1, V09.3-V09.9, V10-V11, V15-V18, V19.3, V19.8-V19.9, V80.0-V80.2, V80.6-V80.9, V81.2-V81.9, V82.2-V82.9, V87.9, V88.9, V89.1, V89.3, V89.9, V90-V99, W00-X59, Y85, Y86) .....	24,368	70.6
9	Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27) .....	29,937	86.7
10	Septicemia (A40-A41) .....	24,621	71.3
...	All other causes (Residual) .....	303,629	879.1

... Category not applicable.

<sup>1</sup> Rank based on number of deaths; see Technical notes.

<sup>2</sup> Includes deaths under 1 year of age.

NOTE: Data are subject to sampling and/or random variation. For information on the relative standard errors of the data and further discussion, see Technical notes.

**Table 8. Infant deaths and infant mortality rates for the 10 leading causes of infant death, by race and Hispanic origin: United States, preliminary 1999**

[Data are based on a continuous file of records received from the States. Rates per 100,000 live births. Figures are based on weighted data rounded to the nearest individual, so categories may not add to totals. Rates for Hispanic origin should be interpreted with caution because of inconsistencies between reporting Hispanic origin on birth and death certificates; see Technical notes]

Rank <sup>1</sup>	Cause of death and race (Based on the Tenth Revision, International Classification of Diseases, 1992)	Number	Rate
All races <sup>2</sup>			
...	All causes .....	27,953	706.3
1	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	5,471	138.2
2	Disorders related to short gestation and low birth weight, not elsewhere classified (P07) .....	4,397	111.1
3	Sudden infant death syndrome (R95) .....	2,583	65.3
4	Newborn affected by maternal complications of pregnancy (P01) .....	1,402	35.4
5	Respiratory distress of newborn (P22) .....	1,111	28.1
6	Newborn affected by complications of placenta, cord and membranes (P02) .....	1,025	25.9
7	Accidents (unintentional injuries)(V01-X59) .....	833	21.0
8	Bacterial sepsis of newborn (P36) .....	689	17.4
9	Diseases of the circulatory system (I00-I99) .....	667	16.9
10	Atelectasis (P28.0-P28.1) .....	649	16.4
...	All other causes (Residual) .....	9,126	230.6
White, total <sup>3</sup>			
...	All causes .....	18,069	577.3
1	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	4,209	134.5
2	Disorders related to short gestation and low birth weight, not elsewhere classified (P07) .....	2,368	75.7
3	Sudden infant death syndrome (R95) .....	1,668	53.3
4	Newborn affected by maternal complications of pregnancy (P01) .....	861	27.5
5	Respiratory distress of newborn (P22) .....	703	22.5
6	Newborn affected by complications of placenta, cord and membranes (P02) .....	633	20.2
7	Accidents (unintentional injuries)(V01-X59) .....	558	17.8
8	Diseases of the circulatory system (I00-I99) .....	452	14.4
9	Atelectasis (P28.0-P28.1) .....	451	14.4
10	Intrauterine hypoxia and birth asphyxia (P20-P21) .....	430	13.7
...	All other causes (Residual) .....	5,736	183.3
White, non-Hispanic			
...	All causes .....	13,557	577.0
1	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	3,125	133.0
2	Disorders related to short gestation and low birth weight, not elsewhere classified (P07) .....	1,695	72.1
3	Sudden infant death syndrome (R95) .....	1,362	58.0
4	Newborn affected by maternal complications of pregnancy (P01) .....	688	29.3
5	Respiratory distress of newborn (P22) .....	514	21.9
6	Newborn affected by complications of placenta, cord and membranes (P02) .....	492	20.9
7	Accidents (unintentional injuries)(V01-X59) .....	432	18.4
8	Intrauterine hypoxia and birth asphyxia (P20-P21) .....	339	14.4
8	Diseases of the circulatory system (I00-I99) .....	339	14.4
10	Atelectasis (P28.0-P28.1) .....	336	14.3
...	All other causes (Residual) .....	4,235	180.2
Black, total <sup>3</sup>			
...	All causes .....	8,832	1,455.7
1	Disorders related to short gestation and low birth weight, not elsewhere classified (P07) .....	1,898	312.8
2	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	1,025	168.9
3	Sudden infant death syndrome (R95) .....	818	134.8
4	Newborn affected by maternal complications of pregnancy (P01) .....	497	81.9
5	Respiratory distress of newborn (P22) .....	375	61.8
6	Newborn affected by complications of placenta, cord and membranes (P02) .....	358	59.0
7	Bacterial sepsis of newborn (P36) .....	258	42.5
8	Accidents (unintentional injuries)(V01-X59) .....	244	40.2
9	Atelectasis (P28.0-P28.1) .....	184	30.3
10	Diseases of the circulatory system (I00-I99) .....	181	29.8
...	All other causes (Residual) .....	2,994	493.5

See footnotes at end of table.

**Table 8. Infant deaths and infant mortality rates for the 10 leading causes of infant death, by race and Hispanic origin: United States, preliminary 1999 - Con.**

[Data are based on a continuous file of records received from the States. Rates per 100,000 live births. Figures are based on weighted data rounded to the nearest individual, so categories may not add to totals. Rates for Hispanic origin should be interpreted with caution because of inconsistencies between reporting Hispanic origin on birth and death certificates; see Technical notes]

Rank <sup>1</sup>	Cause of death and race (Based on the Tenth Revision, International Classification of Diseases, 1992)	Number	Rate
	Hispanic <sup>4</sup>		
...	All causes .....	4,413	578.9
1	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) .....	1,073	140.7
2	Disorders related to short gestation and low birth weight, not elsewhere classified (P07) .....	642	84.2
3	Sudden infant death syndrome (R95) .....	310	40.7
4	Respiratory distress of newborn (P22) .....	176	23.1
5	Newborn affected by maternal complications of pregnancy (P01) .....	170	22.3
6	Accidents (unintentional injuries)(V01-X59) .....	133	17.4
7	Newborn affected by complications of placenta, cord and membranes (P02) .....	127	16.7
8	Diseases of the circulatory system (I00-I99) .....	117	15.3
9	Atelectasis (P28.0-P28.1) .....	107	14.0
10	Bacterial sepsis of newborn (P36) .....	101	13.2
...	All other causes (Residual) .....	1,457	191.1

... Category not applicable.

<sup>1</sup> Rank based on number of deaths; see Technical notes.

<sup>2</sup> Includes races other than white and black.

<sup>3</sup> Race and Hispanic origin are reported separately on both the birth and death certificate. Data for persons of Hispanic origin are included in the data for each race group, according to the decedent's reported race; see Technical notes.

<sup>4</sup> Includes all persons of Hispanic origin of any race; see Technical notes.

NOTE: Data are subject to sampling and/or random variation. For information on the relative standard errors of the data and further discussion, see Technical notes.

## Technical notes

### Nature and sources of data

Preliminary mortality data for 1999 are based on virtually all death records for that year. The data for 1999 are based on a continuous receipt and processing of statistical records through January 3, 2001, by the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS). NCHS received the data from the States' vital registration systems through the Vital Statistics Cooperative Program. In this report U.S. totals include only deaths occurring within the 50 States and the District of Columbia. Data for Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Northern Marianas are included in tables showing data by State, but are not included in U.S. totals.

For 1999 individual records of infant deaths (deaths under 1 year of age) and deaths of persons 1 year and over are weighted (when necessary) to independent counts of deaths occurring in each State. These State-specific counts serve as control totals and are the basis for the record weights in the preliminary file. If the number of records in the preliminary file is greater than the count received from the State, the State-specific number of records in the preliminary file is used instead and the weight is set at 1.0.

For this report two separate mortality files are processed: the medical file, or cause-of-death file, containing records that include demographic and medical information that is used to generate tables showing cause of death; and the demographic file, which includes records from the medical file as well as additional records containing demographic information only and is used to generate tables showing mortality by demographic characteristics only. A State-specific weight is computed for each file by dividing the State control total by the number of records in the preliminary sample. Because there are two separate files, with two separate sets of weights, slight inconsistencies may occur between the demographic and medical tables. [Table I](#) shows the percent completeness of the preliminary file by place of occurrence. The percent completeness is obtained by dividing the number of records in the preliminary file by the control total and multiplying by 100. Although data by place of occurrence are used to compute the weights, all data in this report are tabulated by place of residence.

For selected variables in the mortality file, unknown or not-stated values are imputed. The percent not stated was less than 1 percent for all variables discussed in this report. Detailed information on reporting completeness and imputation procedures may be found in Technical Appendix, *Vital Statistics of the United States: Mortality, 1995* (16).

### Cause-of-death classification

Mortality statistics are compiled in accordance with the World Health Organization (WHO) regulations that specify that member nations classify and code causes of death in accordance with the current revision of the *International Statistical Classification of Diseases and Related Health Problems*. The International Classification of Diseases (ICD) provides the basic guidance used in virtually all countries to code and classify causes of death. It provides not only disease (injury and poisoning) categories but also the rules used to select the single underlying cause of death for tabulation from the several diagnoses that may be reported on a single death certificate, as well as definitions, tabulation lists, the format of the death

certificate, and regulations on the use of the classification. Effective with deaths occurring in 1999, the United States began use of the Tenth Revision of this classification, (ICD-10) (7). During the period 1979-98 causes were coded and classified according to the Ninth Revision (ICD-9) (8).

Causes of death for data presented in this report were coded by procedures described in annual issues of part 2a of the *NCHS Instruction Manual* (17). Cause of death is sometimes not available when preliminary data are sent to NCHS, but is available later when final data are processed. As a result estimates based on the preliminary mortality file for certain causes may be underestimated. Causes that are reported unknown in the preliminary data are coded to Other ill-defined and unspecified causes of mortality (ICD-10 code R99), a subcategory of Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (ICD-10 codes R00-R99). In the final data some of these are reallocated to specified causes if further, more specific cause-of-death information is provided. The preliminary cause-of-death data in this report have not been adjusted to correct this type of bias.

The change from ICD-9 to ICD-10 results in discontinuities for selected cause-of-death trends. These discontinuities are measured using comparability ratios from a comparability study described below in the section Comparability between ICD-9 and ICD-10 for mortality.

### Tabulation lists and cause-of-death ranking

Tabulation lists for ICD-10 were developed to maximize continuity with ICD-9 lists to facilitate trend analysis, and to separately identify causes of death of public health and medical importance. The lists are published in the NCHS Instruction Manual, Part 9, ICD-10 Cause-of-Death Lists for Tabulating Mortality Statistics, Effective 1999 (18). For this report two tabulation lists are used, namely, the List of 113 Selected Causes of Death used for deaths of all ages, and the List of 130 Selected Causes of Infant Death used for infants. These lists are also used to rank leading causes of death for the two population groups. For the List of 113 Selected Causes of Death, the group titles Major cardiovascular diseases (ICD-10 codes I00-I78) and Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (ICD-10 codes R00-R99) are not ranked. In addition, category titles that begin with the words "Other" and "All other" are not ranked to determine the leading causes of death. When one of the titles that represents a subtotal is ranked (for example, Tuberculosis (ICD-10 codes A16-A19)), its component parts are not ranked (in this case, Respiratory tuberculosis (ICD-10 code A16) and Other tuberculosis (ICD-10 codes A17-A19)). For the List of 130 Selected Causes of Infant Death, the same ranking procedures are used, except that the category Major cardiovascular diseases is not in the list.

### Race and Hispanic origin

Race and Hispanic origin are reported separately on the death certificate. Therefore, data shown by race include persons of Hispanic or non-Hispanic origin, and data for Hispanic origin include persons of any race. In this report, unless otherwise specified, deaths of Hispanic origin are included in the totals for each race group—white, black, American Indian, and Asian or Pacific Islander (API)—according to the decedent's race as reported on the death certificate. Data shown for Hispanic persons include all persons of Hispanic origin of any race.

**Table I. Total count of records and percent completeness of preliminary files of infant deaths and deaths 1 year and over: United States, each State and territory, preliminary 1999**

[By place of occurrence]

Area	Infant deaths (under 1 year)			Deaths 1 year and over		
	Count of records	Percent completeness		Count of records	Percent completeness	
		Demographic file	Medical file		Demographic file	Medical file
United States <sup>1</sup> .....	27,995	100.0	99.9	2,367,108	100.0	100.0
Alabama .....	602	100.0	100.0	43,563	100.0	100.0
Alaska .....	50	100.0	100.0	2,610	100.0	100.0
Arizona .....	552	100.0	100.0	40,499	100.0	100.0
Arkansas .....	262	100.0	100.0	27,026	100.0	100.0
California .....	2,819	100.0	100.0	227,243	100.0	100.0
Colorado .....	430	100.0	100.0	27,143	100.0	100.0
Connecticut .....	256	100.0	100.0	29,301	100.0	100.0
Delaware .....	109	100.0	99.1	6,492	100.0	100.0
District of Columbia .....	231	100.0	100.0	7,123	100.0	100.0
Florida .....	1,469	100.0	100.0	162,763	100.0	100.0
Georgia .....	1,038	100.0	100.0	61,571	100.0	100.0
Hawaii .....	121	100.0	100.0	8,321	100.0	100.0
Idaho .....	107	100.0	100.0	9,231	100.0	100.0
Illinois .....	1,489	100.0	99.9	103,942	100.0	100.0
Indiana .....	653	100.0	98.8	55,254	100.0	100.0
Iowa .....	197	100.0	100.0	27,919	100.0	100.0
Kansas .....	237	100.0	99.2	23,542	100.0	100.0
Kentucky .....	360	100.0	99.7	38,526	100.0	100.0
Louisiana .....	655	100.0	100.0	40,868	100.0	100.0
Maine .....	64	100.0	100.0	12,143	100.0	100.0
Maryland .....	493	100.0	100.0	42,362	100.0	100.0
Massachusetts .....	444	100.0	100.0	56,151	100.0	100.0
Michigan .....	1,084	100.0	100.0	84,985	100.0	100.0
Minnesota .....	419	100.0	100.0	38,290	100.0	100.0
Mississippi .....	386	100.0	100.0	27,058	100.0	100.0
Missouri .....	711	100.0	100.0	56,910	100.0	100.0
Montana .....	66	100.0	100.0	8,042	100.0	100.0
Nebraska .....	170	100.0	100.0	15,562	100.0	100.0
Nevada .....	190	100.0	99.5	15,528	100.0	100.0
New Hampshire .....	60	100.0	100.0	9,400	100.0	100.0
New Jersey .....	704	100.0	99.9	71,757	100.0	100.0
New Mexico .....	185	100.0	99.5	13,419	100.0	99.9
New York .....	1,632	100.0	99.6	157,257	100.0	100.0
New York excluding New York City ...	784	100.0	100.0	95,657	100.0	100.0
New York City .....	848	100.0	99.2	61,600	100.0	100.0
North Carolina .....	1,063	100.0	99.8	69,126	100.0	100.0
North Dakota .....	58	100.0	100.0	6,433	100.0	100.0
Ohio .....	1,276	100.0	99.8	106,960	100.0	100.0
Oklahoma .....	403	100.0	99.8	33,317	100.0	100.0
Oregon .....	273	100.0	100.0	29,150	100.0	100.0
Pennsylvania .....	1,107	100.0	99.9	130,051	100.0	100.0
Rhode Island .....	92	100.0	98.9	9,761	100.0	100.0
South Carolina .....	531	100.0	99.6	34,719	100.0	100.0
South Dakota .....	100	100.0	100.0	7,036	100.0	100.0
Tennessee .....	707	100.0	100.0	56,314	100.0	100.0
Texas .....	2,170	100.0	100.0	146,875	100.0	100.0
Utah .....	242	100.0	99.6	12,181	100.0	100.0
Vermont .....	36	100.0	100.0	4,873	100.0	100.0
Virginia .....	652	100.0	100.0	54,194	100.0	100.0
Washington .....	402	100.0	100.0	43,578	100.0	100.0
West Virginia .....	170	100.0	98.2	20,914	100.0	99.9
Wisconsin .....	444	100.0	100.0	45,961	100.0	100.0
Wyoming .....	24	100.0	100.0	3,864	100.0	100.0
Puerto Rico .....	633	100.0	35.5	28,512	100.0	36.5
Virgin Islands .....	16	100.0	100.0	638	100.0	100.0
Guam .....	35	100.0	100.0	689	100.0	100.0
American Samoa .....	20	100.0	100.0	226	100.0	100.0
Northern Marianas .....	8	100.0	100.0	154	100.0	100.0

- - - Data not available.

<sup>1</sup> Excludes data for Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas.NOTE: Percent completeness =  $\frac{\text{Number of records in preliminary file} \times 100}{\text{Count of records}}$

Mortality data on the Hispanic-origin population are based on deaths in all States. Death rates for Hispanic, American Indian, and API persons should be interpreted with caution because of inconsistencies in reporting race on the death certificate as compared with race on censuses, surveys, and birth certificates. Studies have shown under-reporting on death certificates of American Indians, API, and Hispanic decedents; and undercounts of these groups in the censuses (13, 14).

### Infant mortality

Infant mortality rates are the most commonly used index for measuring the risk of dying during the first year of life. The rates presented in this report are calculated by dividing the number of infant deaths that occurred in a 12-month period by the preliminary number of live births for the same period and are presented as rates per 1,000 or per 100,000 live births. For preliminary birth figures used in the denominator for infant mortality rates, see *Births: Preliminary Data for 1999* (1). In contrast to infant mortality rates based on live births, infant death rates are based on the estimated population under 1 year of age (table 1). Infant death rates that appear in tabulations of age-specific death rates in this report are calculated by dividing the number of infant deaths in the 12-month period by the estimated population of persons under 1 year of age on July 1, 1999, and are presented as rates per 100,000 population in this age group. Because of differences in the denominators, infant death rates may differ from infant mortality rates. The linked birth/infant death data set (linked file) is a better source of data for infant deaths and mortality rates by race and ethnicity (15).

### Injury at work

Information on deaths attributed to injuries at work is derived from a separate item on the death certificate that asks the medical certifier whether the death resulted from an injury sustained at work. The item is on the death certificate of all States. Number of deaths, crude death rates, and age-adjusted death rates for injury at work are shown in table 2. Deaths, crude death rates, and age-adjusted death rates for injury at work are shown for ages 15 years and over. Age-adjusted death rates for injury at work were computed using age-specific death rates and the U.S. standard population based on year 2000 standard for ages 15 years and over. See section on Computing rates.

### Life tables

The life table provides a comprehensive measure of the effect of mortality on life expectancy. It is composed of sets of values showing the mortality experience of a hypothetical group of infants born at the same time and subject throughout their lifetime to the age-specific death rates of a particular time period, usually a given year. Beginning with final data reported for 1997, the life table methodology was changed from previous annual reports. Previously, U.S. life tables were abridged and constructed by reference to a standard table (19). In addition, the age range for these life tables was limited to 5-year age groups ending with the age group 85 years and over.

Beginning with 1997 mortality data, a revised life table methodology was used to construct complete life tables by single years of age that extend to age 100 (20) using a methodology similar to that of the

decennial life tables (21). The advantages of the new over the previous methodology are its comparability with decennial life table methodology, greater accuracy, and greater age detail. A comparison of the two methods shows small differences in resulting values for life expectancy (20). Although the new method produces complete life tables, that is, life tables by single years of age, life table data shown in this report are summarized in 5-year age groupings. Life expectancy by age is shown in table 6. To calculate the probability of dying at each age, the revised methodology uses vital statistics death rates for ages under 85 years and mortality data from the Medicare program for ages over 85 years. Medicare data were used to model the probability of dying at ages 85 and over because the data are shown to be significantly more reliable than vital statistics data at the oldest ages (22).

### Comparability between ICD-9 and ICD-10 for mortality

One of the efforts to maintain the tradition of progress in the classification of diseases has been the practice, begun in 1900, to revise about every 10–20 years what is now the International Classification of Diseases (ICD). Each of these revisions has produced some break in the comparability of cause-of-death statistics. ICD-10 has many changes from ICD-9, including considerably greater detail, shifts of inclusion terms and titles from one category, section, or chapter to another; regroupings of diseases; new titles and sections; and modifications in coding rules (7). As a result, serious breaks occur in comparability for a number of causes of death. Measures of this discontinuity are essential to the interpretation of mortality trends. Ratios of comparability between ICD-9 and ICD-10 have been computed for this purpose.

The method followed by the United States for constructing comparability ratios for mortality data is that recommended by the International Conference for the Sixth Revision of the International List of Diseases and Causes of Death, which convened in France in 1948. The Conference recommended that deaths for a country as a whole in 1949 or in 1950 be coded according to the Detailed List of Causes of Death of the Fifth Revision, and that dual tabulations of these data be published in such a way as to indicate the changes resulting from the application of the new revision. The dual coding method to measure discontinuities in mortality data resulting from the introduction of a new revision was used in this study between ICD-9 and ICD-10. This makes the fifth time since the recommendation of the International Conference for the Sixth Revision that the United States has used this method (9).

Studies of the comparability between revisions of the ICD have been carried out and published at least since the Fifth Revision. Comparability studies—also called bridge-coding studies—involve dual classification of a single year of mortality data, that is, classifying the underlying cause of death on mortality records by the new revision and the previous revision. The key element of a comparability study is the comparability ratio, which is derived from the dual classification. It is calculated by dividing the number of deaths for a selected cause of death classified by the new revision by the number of deaths classified to the most nearly comparable cause of death by the previous revision. The resulting ratio represents the net effect of the new revision on statistics for this cause and can be used as a factor to adjust mortality statistics for causes of death classified by a previous revision to be comparable to those for the same cause classified by the new revision.

A comparability ratio of 1.00 indicates that the same number of deaths was assigned to a particular cause or combination of causes

whether the Ninth or Tenth Revision was used. A ratio showing perfect correspondence (1.00) between the two revisions does not necessarily indicate that the cause was unaffected by changes in classification and coding procedures but merely that there was no net change.

A ratio of less than 1.00 results from a decrease in assignments of death to a cause in ICD-10 compared with ICD-9. A ratio of more than 1.00 results from an increase in assignments of deaths to a cause in ICD-10 compared with the comparable ICD-9 cause.

One of the major objectives of the comparability study was to furnish ratios that measure the degree of discontinuity between data tabulated by the cause lists published under ICD-10 and data tabulated by the most nearly comparable cause lists published under ICD-9.

Ratios are presented for the lists that are used for the preliminary mortality statistics. The list of selected causes for which preliminary data are published has been expanded from the 72 causes plus HIV infection and Alzheimer's disease published under ICD-9, to 113 causes under ICD-10. The list of selected causes of infant death was expanded from 61 plus HIV infection to 130 causes. The lists are as follows:

ICD-10	ICD-9
1. List of 113 Selected Causes of Death	1. List of 72 Selected Causes of Death, HIV infection and Alzheimer's disease
2. List of 130 Selected Causes of Infant Death	2. List of 61 Selected Causes of Infant Death and HIV infection

The data used in the ICD-10 Comparability Study are cause-of-death information from a large sample of death certificates for deaths occurring in 1996 filed in the 50 States and the District of Columbia. [Table II](#) shows comparability ratios and their standard errors for the List of 113 Selected Causes of Death. [Table III](#) shows the same information for the List of 130 Selected Causes of Infant Death. The cause-of-death information in the sample is based on death records in which the underlying cause of death is classified by ICD-9 and ICD-10. The sample comprises 1,852,651 (80 percent) out of the total 2,314,690 resident deaths that occurred in the United States during 1996. The sample is treated as if it were random. As a result, standard errors associated with comparability ratios are based on sampling and stochastic (random) variation (9). Most of the records in the study were processed using the NCHS automated systems for selecting the underlying cause of death. Records that could not be processed were rejected for manual coding. Since the rejects are not fully representative of the complete file, the comparability ratios in this report are biased to an unknown extent. For most categories the bias is believed to be small. In those instances where comparability ratios either could not be calculated because of rejected records or because they were deemed unavailable, [Tables II](#) and [III](#) display an asterisk (\*).

### Selected causes of death with problems of interpretation

Deaths for selected causes in the List of 113 Selected Causes of Death and the List of 130 Selected Causes of Infant Death ([tables 2](#) and [5](#)) are marked with a footnote. For these causes, the changes between the comparability-modified 1998 rates and the 1999 rates for

these causes should be interpreted with caution. The following paragraphs attempt to explain some of the issues in interpreting these data. For further explanation of these issues, refer to *Comparability of cause-of-death between ICD-9 and ICD-10: Preliminary Estimates* (9).

*Tuberculosis* ([table 2](#))—The comparability ratio for Tuberculosis (ICD-10 codes A16–A19) is 0.8547 ([table II](#)), a decrease of about 15 percent due to ICD-10. A small part of this decrease is due to an error in the program that selects the underlying cause of death. Deaths are being classified in error to ICD-10 code B90.9, Sequelae of tuberculosis. This error will be corrected with the release of final 1999 mortality data. The other part of the decrease is due to a change in the way Lupus, not otherwise specified is classified. In ICD-9, Lupus, not otherwise specified was assigned a tuberculous code (ICD-9 code 017.0). In ICD-10, this is not the case and Lupus, not otherwise specified is assigned to Lupus erythematosus (ICD-10 code L93). Also, Pneumoconiosis associated with tuberculosis (ICD-10 code J65) is a new category in ICD-10 included in the category Pneumoconiosis and chemical effects (ICD-10 codes J60–J66, J68). In ICD-9, deaths with this diagnosis would be assigned to Tuberculosis.

*Viral hepatitis and Other and unspecified infectious and parasitic diseases and their sequelae* ([table 2](#))—Viral hepatitis (ICD-10 codes B15–B19) decreased by about 17 percent with the implementation of ICD-10 (with a comparability ratio of 0.8343, see [table II](#)). Most of the decrease is that in ICD-10, Viral hepatitis is a direct sequel of HIV disease. In ICD-9, this was not the case. Thus, when HIV disease and Viral hepatitis are both listed on the death certificate, HIV disease is selected as the underlying cause of death. A part of the decrease is due to errors in selecting the underlying cause of death. Some deaths are being classified in error to ICD-10 code B94.2, Sequelae of viral hepatitis, and tabulated in the category Other and unspecified infectious and parasitic diseases and their sequelae. This error will be corrected with the release of final 1999 mortality data.

*HIV disease* ([table II](#))—The preliminary comparability ratio for HIV disease shown in [table II](#) (1.1448) is different from that shown in the report *Comparability of cause-of-death between ICD-9 and ICD-10: Preliminary estimates* (9), which is based on 1996 deaths. Because the composition of HIV disease deaths changed substantially from 1996 to 1998, the preliminary comparability ratio is understated. Taking into account this compositional change, the comparability ratio for HIV disease in this report is based on the 1998 data year.

*Other nutritional deficiencies* ([table 2](#))—The high comparability ratio for Other nutritional deficiencies (ICD-10 codes E50–E64) is due to a program error that will be corrected with the release of final 1999 mortality data. Ninety-four percent of the increase in this category is in ICD-10 code E64.0 (Sequelae of protein-calorie malnutrition). Malnutrition (ICD-10 codes E40–E64) is being converted in error to sequelae based upon information on the death certificate about the duration of the condition. The error affects both of the subcategories of Nutritional deficiencies (ICD-10 codes E40–E64), but the comparability ratio for the broader category (1.1636, as shown in [table II](#)) is correct.

*Alzheimer's disease* ([table 2](#))—The comparability ratio for Alzheimer's disease (ICD-10 code G30) is 1.5536 ([table II](#)), indicating a 55 percent increase in Alzheimer's disease deaths when classified by ICD-10. In absolute terms, more than 10,000 additional deaths were classified to Alzheimer's disease in ICD-10 than in ICD-9. Nearly all



**Table II. Comparable category codes and estimated comparability ratios for 113 selected causes of death, injury by firearms, Drug-induced deaths and Alcohol-induced deaths according to the Ninth and Tenth Revisions, *International Classification of Diseases***

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
Salmonella infections . . . . .	A01-A02	002-003	30	37	0.8108	0.0644	7.9	0.6846	0.9370
Shigellosis and amebiasis . . . . .	A03,A06	004,006	*	*	*	*	*	*	*
Certain other intestinal infections . . . . .	A04,A07-A09	007-009	*	*	*	*	*	*	*
Tuberculosis . . . . .	A16-A19	010-018	653	764	0.8547	0.0172	2.0	0.8209	0.8885
Respiratory tuberculosis . . . . .	A16	010-012	518	572	0.9056	0.0201	2.2	0.8662	0.9450
Other tuberculosis . . . . .	A17-A19	013-018	135	192	0.7031	0.0407	5.8	0.6233	0.7830
Whooping cough . . . . .	A37	033	*	*	*	*	*	*	*
Scarlet fever and erysipelas . . . . .	A38,A46	034.1-035	*	*	*	*	*	*	*
Meningococcal infection . . . . .	A39	036	221	222	0.9955	0.0149	1.5	0.9663	1.0247
Septicemia . . . . .	A40-A41	038	21,258	17,791	1.1949	0.0042	0.3	1.1867	1.2030
Syphilis . . . . .	A50-A53	090-097	21	33	0.6364	0.1184	18.6	0.4043	0.8685
Acute poliomyelitis . . . . .	A80	045	*	*	*	*	*	*	*
Arthropod-borne viral encephalitis . . . . .	A83-A84,A85.2	062-064	*	*	*	*	*	*	*
Measles . . . . .	B05	055	*	*	*	*	*	*	*
Viral hepatitis . . . . .	B15-B19	070	1,123	1,346	0.8343	0.0120	1.4	0.8109	0.8578
Human immunodeficiency virus (HIV) disease . . . . .	B20-B24	*042-*044	12,765	11,150	1.1448	0.0045	0.4	1.1360	1.1536
Malaria . . . . .	B50-B54	084	*	*	*	*	*	*	*
Other and unspecified infectious and parasitic diseases and their sequelae . . . . .	A00,A05,A20-A36,A42-A44,A48-A49, A54-A79,A81-A82,A85.0-A85.1,A85.8 A86-B04,B06-B09,B25-B49,B55-B99	001,005,020-032,037,039-041,046-054, 056-061,065-066,071-083,085-088, 098-134,136-139,771.3	2,865	2,607	1.0990	0.0154	1.4	1.0688	1.1291
Malignant neoplasms . . . . .	C00-C97	140-208	464,688	461,544	1.0068	0.0002	0.0	1.0064	1.0072
Malignant neoplasms of lip, oral cavity and pharynx . . . . .	C00-C14	140-149	5,927	6,172	0.9603	0.0040	0.4	0.9525	0.9681
Malignant neoplasm of esophagus . . . . .	C15	150	9,596	9,630	0.9965	0.0020	0.2	0.9926	1.0003
Malignant neoplasm of stomach . . . . .	C16	151	11,480	11,408	1.0063	0.0019	0.2	1.0025	1.0101
Malignant neoplasms of colon, rectum and anus . . . . .	C18-C21	153-154	48,583	48,619	0.9993	0.0009	0.1	0.9975	1.0010
Malignant neoplasms of liver and intrahepatic bile ducts . . . . .	C22	155	9,732	10,102	0.9634	0.0023	0.2	0.9588	0.9679
Malignant neoplasm of pancreas . . . . .	C25	157	24,313	24,361	0.9980	0.0009	0.1	0.9963	0.9997
Malignant neoplasm of larynx . . . . .	C32	161	3,209	3,194	1.0047	0.0053	0.5	0.9943	1.0150
Malignant neoplasms of trachea, bronchus and lung . . . . .	C33-C34	162	131,750	133,936	0.9837	0.0005	0.1	0.9827	0.9846
Malignant melanoma of skin . . . . .	C43	172	5,941	6,139	0.9677	0.0032	0.3	0.9614	0.9741
Malignant neoplasm of breast . . . . .	C50	174-175	38,102	37,891	1.0056	0.0010	0.1	1.0036	1.0075
Malignant neoplasm of cervix uteri . . . . .	C53	180	3,753	3,802	0.9871	0.0034	0.3	0.9805	0.9938
Malignant neoplasms of corpus uteri and uterus, part unspecified . . . . .	C54-C55	179,182	5,318	5,183	1.0260	0.0040	0.4	1.0182	1.0339
Malignant neoplasm of ovary . . . . .	C56	183.0	11,292	11,344	0.9954	0.0016	0.2	0.9923	0.9985
Malignant neoplasm of prostate . . . . .	C61	185	30,672	30,267	1.0134	0.0015	0.1	1.0105	1.0162
Malignant neoplasms of kidney and renal pelvis . . . . .	C64-C65	189.0,189.1	9,521	9,521	1.0000	0.0022	0.2	0.9957	1.0043
Malignant neoplasm of bladder . . . . .	C67	188	9,563	9,594	0.9968	0.0026	0.3	0.9916	1.0019
Malignant neoplasms of meninges, brain and other parts of central nervous system . . . . .	C70-C72	191-192	10,039	10,359	0.9691	0.0025	0.3	0.9642	0.9740
Malignant neoplasms of lymphoid, hematopoietic and related tissue . . . . .	C81-C96	200-208	44,715	44,530	1.0042	0.0012	0.1	1.0019	1.0064
Hodgkin's disease . . . . .	C81	201	1,021	1,036	0.9855	0.0089	0.9	0.9680	1.0030
Non-Hodgkin's lymphoma . . . . .	C82-C85	200,202	17,924	18,326	0.9781	0.0018	0.2	0.9745	0.9817
Leukemia . . . . .	C91-C95	204-208	16,600	16,405	1.0119	0.0019	0.2	1.0083	1.0155

See footnotes at end of table.

Table II. Comparable category codes and estimated comparability ratios for 113 selected causes of death, injury by firearms, Drug-induced deaths and Alcohol-induced deaths according to the Ninth and Tenth Revisions, *International Classification of Diseases—Con.*

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
Multiple myeloma and immunoproliferative neoplasms. . . . .	C88,C90	203	9,099	8,763	1.0383	0.0030	0.3	1.0324	1.0443
Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue . . . . .	C96	---	*	*	*	*	*	*	*
All other and unspecified malignant neoplasms. . . . .	C17,C23-C24,C26-C31,C37-C41, C44-C49,C51-C52,C57-C60, C66,C68-C69,C73-C80,C97	152, 156,158-160,163-171,173,181, 183.2-184,186-187,189.2-190,193-199	51,182	45,492	1.1251	0.0021	0.2	1.1210	1.1292
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior . . . . .	D00-D48	210-239	9,263	5,532	1.6744	0.0164	1.0	1.6422	1.7067
Anemias . . . . .	D50-D64	280-285	3,059	3,200	0.9559	0.0077	0.8	0.9409	0.9710
Diabetes mellitus . . . . .	E10-E14	250	48,636	48,242	1.0082	0.0011	0.1	1.0060	1.0103
Nutritional deficiencies . . . . .	E40-E64	260-269	3,215	2,763	1.1636	0.0165	1.4	1.1312	1.1960
Malnutrition . . . . .	E40-E46	260-263	2,607	2,665	0.9782	0.0151	1.5	0.9487	1.0078
Other nutritional deficiencies . . . . .	E50-E64	264-269	608	98	6.2041	0.5961	9.6	5.0358	7.3724
Meningitis . . . . .	G00,G03	320-322	592	584	1.0137	0.0136	1.3	0.9871	1.0403
Parkinson's disease . . . . .	G20-G21	332	10,404	10,392	1.0012	0.0028	0.3	0.9956	1.0067
Alzheimer's disease . . . . .	G30	331.0	29,707	19,121	1.5536	0.0071	0.5	1.5398	1.5675
Major cardiovascular diseases . . . . .	I00-I78	390-434,436-448	796,919	798,435	0.9981	0.0002	0.0	0.9977	0.9985
Diseases of heart . . . . .	I00-I09,I11,I13,I20-I51	390-398,402,404,410-429	615,564	624,405	0.9858	0.0002	0.0	0.9854	0.9863
Acute rheumatic fever and chronic rheumatic heart diseases . . . . .	I00-I09	390-398	2,446	2,980	0.8208	0.0089	1.1	0.8034	0.8382
Hypertensive heart disease . . . . .	I11	402	17,322	21,577	0.8028	0.0028	0.3	0.7973	0.8083
Hypertensive heart and renal disease . . . . .	I13	404	2,170	2,027	1.0705	0.0160	1.5	1.0392	1.1019
Ischemic heart diseases . . . . .	I20-I25	410-414,429.2	466,459	466,935	0.9990	0.0002	0.0	0.9985	0.9994
Acute myocardial infarction . . . . .	I21-I22	410	178,125	180,169	0.9887	0.0003	0.0	0.9880	0.9893
Other acute ischemic heart diseases . . . . .	I24	411	2,667	2,638	1.0110	0.0117	1.2	0.9880	1.0340
Other forms of chronic ischemic heart disease. . . . .	I20,I25	412-414,429.2	285,667	284,128	1.0054	0.0004	0.0	1.0046	1.0062
Atherosclerotic cardiovascular disease, so described. . . . .	I25.0	429.2	64,354	61,362	1.0488	0.0016	0.2	1.0456	1.0519
All other forms of chronic ischemic heart disease. . . . .	I20,I25.1-I25.9	412-414	221,313	222,766	0.9935	0.0004	0.0	0.9927	0.9942
Other heart diseases . . . . .	I26-I51	415-429.1,429.3-429.9	127,167	130,886	0.9716	0.0010	0.1	0.9696	0.9736
Acute and subacute endocarditis. . . . .	I33	421	552	554	0.9964	0.0137	1.4	0.9695	1.0233
Diseases of pericardium and acute myocarditis . . . . .	I30-I31,I40	420,422-423	489	475	1.0295	0.0160	1.6	0.9981	1.0608
Heart failure . . . . .	I50	428	44,297	42,554	1.0410	0.0013	0.1	1.0384	1.0435
All other forms of heart disease . . . . .	I26-I28,I34-I38,I42-I49,151	415-417,424-427,429.0-429.1,429.3-429.9	81,829	87,303	0.9373	0.0014	0.2	0.9345	0.9401
Essential (primary) hypertension and hypertensive renal disease . . . . .	I10,I12	401,403	11,958	10,684	1.1192	0.0050	0.4	1.1094	1.1291
Cerebrovascular diseases . . . . .	I60-I69	430-434,436-438	137,264	129,640	1.0588	0.0008	0.1	1.0572	1.0604
Atherosclerosis . . . . .	I70	440	13,894	14,417	0.9637	0.0025	0.3	0.9588	0.9686
Other diseases of circulatory system . . . . .	I71-I78	441-448	18,239	19,289	0.9456	0.0021	0.2	0.9414	0.9498
Aortic aneurysm and dissection. . . . .	I71	441	12,216	12,201	1.0012	0.0010	0.1	0.9992	1.0032
Other diseases of arteries, arterioles and capillaries. . . . .	I72-I78	442-448	6,023	7,088	0.8497	0.0053	0.6	0.8394	0.8601
Other disorders of circulatory system . . . . .	I80-I99	451-459	2,984	2,899	1.0293	0.0172	1.7	0.9956	1.0631
Influenza and pneumonia . . . . .	J10-J18	480-487	50,526	72,371	0.6982	0.0018	0.3	0.6947	0.7016
Influenza . . . . .	J10-J11	487	572	567	1.0088	0.0073	0.7	0.9945	1.0231
Pneumonia . . . . .	J12-J18	480-486	49,954	71,804	0.6957	0.0018	0.3	0.6922	0.6992
Other acute lower respiratory infections. . . . .	J20-J22	466	346	355	0.9746	0.0392	4.0	0.8978	1.0515
Acute bronchitis and bronchiolitis . . . . .	J20-J21	466	265	355	0.7465	0.0264	3.5	0.6947	0.7983

See footnotes at end of table.

**Table II. Comparable category codes and estimated comparability ratios for 113 selected causes of death, injury by firearms, Drug-induced deaths and Alcohol-induced deaths according to the Ninth and Tenth Revisions, *International Classification of Diseases*—Con.**

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
Unspecified acute lower respiratory infection . . . . .	J22	---	*	*	*	*	*	*	*
Chronic lower respiratory diseases. . . . .	J40-J47	490-494,496	94,326	90,022	1.0478	0.0009	0.1	1.0460	1.0496
Bronchitis, chronic and unspecified . . . . .	J40-J42	490-491	913	2,320	0.3935	0.0107	2.7	0.3726	0.4145
Emphysema. . . . .	J43	492	14,369	14,774	0.9726	0.0031	0.3	0.9666	0.9786
Asthma . . . . .	J45-J46	493	4,217	4,718	0.8938	0.0061	0.7	0.8819	0.9057
Other chronic lower respiratory diseases. . . . .	J44,J47	494,496	74,827	68,210	1.0970	0.0014	0.1	1.0943	1.0998
Pneumoconioses and chemical effects . . . . .	J60-J66,J68	500-506	860	845	1.0178	0.0099	1.0	0.9983	1.0372
Pneumonitis due to solids and liquids. . . . .	J69	507	10,183	9,104	1.1185	0.0048	0.4	1.1092	1.1279
Other diseases of respiratory system . . . . .	J00-J06,J30-J39,J67,J70-J98	034.0,460-465,470-478,495,508-519	16,656	14,269	1.1673	0.0052	0.4	1.1572	1.1774
Peptic ulcer . . . . .	K25-K28	531-534	3,574	3,686	0.9696	0.0045	0.5	0.9608	0.9784
Diseases of appendix . . . . .	K35-K38	540-543	209	202	1.0347	0.0242	2.3	0.9873	1.0820
Hernia . . . . .	K40-K46	550-553	658	633	1.0395	0.0154	1.5	1.0094	1.0696
Chronic liver disease and cirrhosis . . . . .	K70,K73-K74	571	21,688	20,920	1.0367	0.0027	0.3	1.0314	1.0420
Alcoholic liver disease. . . . .	K70	571.0-571.3	10,147	9,965	1.0183	0.0050	0.5	1.0085	1.0281
Other chronic liver disease and cirrhosis. . . . .	K73-K74	571.4-571.9	11,541	10,955	1.0535	0.0041	0.4	1.0454	1.0615
Cholelithiasis and other disorders of gallbladder. . . . .	K80-K82	574-575	1,725	1,803	0.9567	0.0060	0.6	0.9450	0.9685
Nephritis, nephrotic syndrome and nephrosis . . . . .	N00-N07,N17-N19,N25-N27	580-589	24,939	20,242	1.2320	0.0044	0.4	1.2234	1.2407
Acute and rapidly progressive nephritic and nephrotic syndrome . . . . .	N00-N01,N04	580-581	161	249	0.6466	0.0342	5.3	0.5796	0.7136
Chronic glomerulonephritis, nephritis and nephropathy not specified as acute or chronic, and renal sclerosis unspecified. . . . .	N02-N03,N05-N07,N26	582-583,587	468	1,213	0.3858	0.0144	3.7	0.3575	0.4141
Renal failure . . . . .	N17-N19	584-586	24,290	18,758	1.2949	0.0050	0.4	1.2852	1.3047
Other disorders of kidney. . . . .	N25,N27	588-589	20	22	0.9091	0.0867	9.5	0.7392	1.0790
Infections of kidney. . . . .	N10-N12,N13.6,N15.1	590	731	726	1.0069	0.0144	1.4	0.9786	1.0352
Hyperplasia of prostate . . . . .	N40	600	326	327	0.9969	0.0159	1.6	0.9658	1.0280
Inflammatory diseases of female pelvic organs . . . . .	N70-N76	614-616	63	64	0.9844	0.0410	4.2	0.9040	1.0648
Pregnancy, childbirth and the puerperium. . . . .	O00-O99	630-676	*	*	*	*	*	*	*
Pregnancy with abortive outcome . . . . .	O00-O07	630-639	*	*	*	*	*	*	*
Other complications of pregnancy, childbirth and the puerperium . . . . .	O10-O99	640-676	*	*	*	*	*	*	*
Certain conditions originating in the perinatal period . . . . .	P00-P96	760-771.2,771.4-779	10,184	9,555	1.0658	0.0033	0.3	1.0593	1.0724
Congenital malformations, deformations and chromosomal abnormalities . . . . .	Q00-Q99	740-759	5,950	7,025	0.8470	0.0055	0.6	0.8362	0.8577
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified . . . . .	R00-R99	780-799	16,940	17,732	0.9553	0.0034	0.4	0.9487	0.9620
All other diseases (Residual) . . . . .	Residual	Residual	109,853	122,107	0.8996	0.0015	0.2	0.8968	0.9025
Accidents (unintentional injuries) . . . . .	V01-X59,Y85-Y86	E800-E869,E880-E929	31,084	30,163	1.0305	0.0014	0.1	1.0278	1.0333
Transport accidents . . . . .	V01-V99,Y85	E800-E848,E929.0,E929.1	17,547	17,586	0.9978	0.0006	0.1	0.9966	0.9990
Motor vehicle accidents. . . . .	V02-V04,V09.0,V09.2,V12-V14, V19.0-V19.2,V19.4-V19.6,V20-V79, V80.3-V80.5,V81.0-V81.1,V82.0-V82.1, V83-V86,V87.0-V87.8,V88.0-V88.8, V89.0,V89.2	E810-E825	16,632	17,051	0.9754	0.0006	0.1	0.9742	0.9766

See footnotes at end of table.

**Table II. Comparable category codes and estimated comparability ratios for 113 selected causes of death, injury by firearms, Drug-induced deaths and Alcohol-induced deaths according to the Ninth and Tenth Revisions, *International Classification of Diseases—Con.***

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
Other land transport accidents . . . . .	V01,V05–V06,V09.1,V09.3–V09.9, V10–V11,V15–V18,V19.3,V19.8–V19.9, V80.0–V80.2,V80.6–V80.9,V81.2–V81.9, V82.2–V82.9,V87.8,V88.9,V89.1,V89.3, V89.9	E800–E807,E826–E829	*	*	*	*	*	*	*
Water, air and space, and other and unspecified transport accidents and their sequelae . . . . .	V90–V99,Y85	E830–E848,E929.0,E929.1	351	347	1.0115	0.0209	2.1	0.9706	1.0525
Nontransport accidents . . . . .	W00–X59,Y86	E850–E869,E880–E928,E929.2–E929.9	13,537	12,577	1.0763	0.0035	0.3	1.0696	1.0831
Falls . . . . .	W00–W19	E880–E888	5,173	6,152	0.8409	0.0049	0.6	0.8313	0.8505
Accidental discharge of firearms . . . . .	W32–W34	E922	493	466	1.0579	0.0127	1.2	1.0331	1.0828
Accidental drowning and submersion . . . . .	W65–W74	E910	283	284	0.9965	0.0127	1.3	0.9716	1.0213
Accidental exposure to smoke, fire and flames . . . . .	X00–X09	E890–E899	493	506	0.9743	0.0089	0.9	0.9568	0.9918
Accidental poisoning and exposure to noxious substance . . . . .	X40–X49	E850–E869,E924.1	*	*	*	*	*	*	*
Other and unspecified nontransport accidents and their sequelae . . . . .	W20–W31,W35–W64,W75–W99, X10–X39,X50–X59,Y86	E900–E909,E911–E921,E923–E924.0, E924.8–E928,E929.2–E929.9	6,698	4,721	1.4188	0.0123	0.9	1.3947	1.4428
Intentional self-harm (suicide) . . . . .	X60–X84,Y87.0	E950–E959	18,352	18,422	0.9962	0.0005	0.0	0.9952	0.9972
Intentional self-harm (suicide) by discharge of firearms . . . . .	X72–X74	E955.0–E955.4	14,157	14,183	0.9982	0.0007	0.1	0.9968	0.9996
Intentional self-harm (suicide) by other and unspecified means and their sequelae . . . . .	X60–X71,X75–X84,Y87.0	E950–E954,E955.5–E959	4,195	4,239	0.9896	0.0023	0.2	0.9850	0.9942
Assault (homicide) . . . . .	X85–Y09,Y87.1	E960–E969	12,287	12,308	0.9983	0.0006	0.1	0.9972	0.9994
Assault (homicide) by discharge of firearms . . . . .	X93–X95	E965.0–E965.4	8,718	8,745	0.9969	0.0008	0.1	0.9953	0.9985
Assault (homicide) by other and unspecified means and their sequelae . . . . .	X85–X92,X96–Y09,Y87.1	E960–E964,E965.5–E969	3,569	3,563	1.0017	0.0024	0.2	0.9969	1.0064
Legal intervention . . . . .	Y35,Y89.0	E970–E978	*	*	*	*	*	*	*
Events of undetermined intent . . . . .	Y10–Y34,Y87.2,Y89.9	E980–E989	*	*	*	*	*	*	*
Discharge of firearms, undetermined intent . . . . .	Y22–Y24	E985.0–E985.4	*	*	*	*	*	*	*
Other and unspecified events of undetermined intent and their sequelae . . . . .	Y10–Y21,Y25–Y34,Y87.2,Y89.9	E980–E984,E985.5–E989	*	*	*	*	*	*	*
Operations of war and their sequelae . . . . .	Y36,Y89.1	E990–E999	*	*	*	*	*	*	*
Complications of medical and surgical care . . . . .	Y40–Y84,Y88	E870–E879,E930–E949	*	*	*	*	*	*	*
Injury by firearms <sup>1</sup> . . . . .	W32–W34,X72–X74,X93–X95, Y22–Y24,Y35.0	E922,E955.0–E955.4,E965.0–E965.4, E970,E985.0–E985.4	23,355	23,418	0.9973	0.0006	0.1	0.9961	0.9985
Drug-induced deaths <sup>1</sup> . . . . .	F11.0–F11.5,F11.7–F11.9,F12.0–F12.5, F12.7–F12.9,F13.0–F13.5,F13.7–F13.9, F14.0–F14.5,F14.7–F14.9,F15.0–F15.5, F15.7–F15.9,F16.0–F16.5,F16.7–F16.9, F17.0,F17.3–F17.5,F17.7–F17.9, F18.0–F18.5,F18.7–F18.9,F19.0–F19.5, F19.7–F19.9,X40–X44,X60–X64,X85, Y10–Y14	292,304,305.2–305.9,E850–E858, E950.0–E950.5,E962.0,E980.0–E980.5	1,158	969	1.1950	0.0225	1.9	1.1509	1.2391
Alcohol-induced deaths <sup>1</sup> . . . . .	F10,G31.2,G62.1,I42.6,K29.2,K70, R78.0,X45,X65,Y15	291,303,305.0,357.5,425.5,535.3, 571.0–571.3,790.3,E860	14,783	15,269	0.9682	0.0025	0.3	0.9633	0.9731

\* Figure does not meet standards of reliability or precision; see Technical notes.

--- Category not applicable.

0.0 Quantity more than zero but less than 0.05.

<sup>1</sup>Included in selected categories.

**Table III. Comparable category codes and estimated comparability ratios for 130 selected causes of infant death according to the Ninth and Tenth Revisions, *International Classification of Diseases***

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
Certain infectious and parasitic diseases . . . . .	A00-B99	001-033,034.1-134,136-139,771.3	284	387	0.7339	0.0339	4.6	0.6673	0.8004
Certain intestinal infectious diseases . . . . .	A00-A08	001-008	*	*	*	*	*	*	*
Diarrhea and gastroenteritis of infectious origin . . . . .	A09	009	0	144	0.0000	0.0000	0.0	0.0000	0.0000
Tuberculosis . . . . .	A16-A19	010-018	*	*	*	*	*	*	*
Tetanus . . . . .	A33,A35	037,771.3	*	*	*	*	*	*	*
Diphtheria . . . . .	A36	032	*	*	*	*	*	*	*
Whooping cough . . . . .	A37	033	*	*	*	*	*	*	*
Meningococcal infection . . . . .	A39	036	25	26	0.9615	0.0377	3.9	0.8876	1.0355
Septicemia . . . . .	A40-A41	038	167	121	1.3802	0.0713	5.2	1.2403	1.5200
Congenital syphilis . . . . .	A50	090	*	*	*	*	*	*	*
Gonococcal infection . . . . .	A54	098	*	*	*	*	*	*	*
Viral diseases . . . . .	A80-B34	042-079	62	62	1.0000	0.0757	7.6	0.8517	1.1483
Acute poliomyelitis . . . . .	A80	045	*	*	*	*	*	*	*
Varicella (chickenpox) . . . . .	B01	052	*	*	*	*	*	*	*
Measles . . . . .	B05	055	*	*	*	*	*	*	*
Human immunodeficiency virus (HIV) disease . . . . .	B20-B24	042-044	*	*	*	*	*	*	*
Mumps . . . . .	B26	072	*	*	*	*	*	*	*
Other and unspecified viral diseases . . . . .	A81-B00,B02-B04,B06-B19,B25, B27-B34	046-051,053-054,056-071,073-079	35	36	0.9722	0.1255	12.9	0.7262	1.2182
Candidiasis . . . . .	B37	112	*	*	*	*	*	*	*
Malaria . . . . .	B50-B54	084	*	*	*	*	*	*	*
Pneumocystosis . . . . .	B59	136.3	*	*	*	*	*	*	*
All other and unspecified infectious and parasitic diseases . . . . .	A20-A32,A38,A42-A49,A51-A53, A55-A79,B35-B36,B38-B49, B55-B58,B60-B99	020-031,034.1-035,039-041,080-083, 085-088,091-097,099-111,114-134, 136.0-136.2,136.4-139	*	*	*	*	*	*	*
Neoplasms . . . . .	C00-D48	140-239	73	72	1.0139	0.0420	4.1	0.9317	1.0961
Malignant neoplasms . . . . .	C00-C97	140-208	48	46	1.0435	0.0544	5.2	0.9369	1.1501
Hodgkin's disease and non-Hodgkin's lymphomas . . . . .	C81-C85	200-202	*	*	*	*	*	*	*
Leukemia . . . . .	C91-C95	204-208	*	*	*	*	*	*	*
Other and unspecified malignant neoplasms . . . . .	C00-C80,C88-C90,C96-C97	140-199,203	30	28	1.0714	0.0906	8.5	0.8939	1.2489
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior . . . . .	D00-D48	210-239	25	26	0.9615	0.1131	11.8	0.7398	1.1833
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism . . . . .	D50-D89	135, 279-289	35	50	0.7000	0.0803	11.5	0.5427	0.8573
Anemias . . . . .	D50-D64	280-285	*	*	*	*	*	*	*
Other diseases of blood and blood-forming organs . . . . .	D65-D76	286-289	*	*	*	*	*	*	*
Certain disorders involving the immune mechanism . . . . .	D80-D89	135,279	*	*	*	*	*	*	*
Endocrine, nutritional and metabolic diseases . . . . .	E00-E88	240-278	112	129	0.8682	0.0555	6.4	0.7595	0.9770
Short stature, not elsewhere classified . . . . .	E34.3	259.4	*	*	*	*	*	*	*
Malnutrition and other nutritional deficiencies . . . . .	E40-E64	260-269	*	*	*	*	*	*	*
Cystic fibrosis . . . . .	E84	277.0	*	*	*	*	*	*	*
Volume depletion, disorders of fluid, electrolyte and acid-base balance . . . . .	E86-E87	276	40	53	0.7547	0.0852	11.3	0.5878	0.9217

See footnotes at end of table.

Table III. Comparable category codes and estimated comparability ratios for 130 selected causes of infant death according to the Ninth and Tenth Revisions, *International Classification of Diseases—Con.*

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
All other endocrine, nutritional and metabolic diseases . . . . .	E00-E32,E34.0-E34.2,E34.4-E34.9, E65-E83,E85,E88	240-259.3,259.8-259.9,270-275, 277.1-278	64	55	1.1636	0.0809	6.9	1.0051	1.3221
Diseases of the nervous system . . . . .	G00-G98	320-359,435	305	286	1.0664	0.0263	2.5	1.0149	1.1180
Meningitis . . . . .	G00,G03	320-322	70	70	1.0000	0.0404	4.0	0.9208	1.0792
Infantile spinal muscular atrophy, type I (Werdnig-Hoffman) . . . . .	G12.0	335.0	47	47	1.0000	0.0521	5.2	0.8978	1.1022
Infantile cerebral palsy . . . . .	G80	343	*	*	*	*	*	*	*
Anoxic brain damage, not elsewhere classified . . . . .	G93.1	348.1	29	30	0.9667	0.1269	13.1	0.7179	1.2155
Other diseases of nervous system . . . . .	G04,G06-G11,G12.1-G12.9, G20-G72,G81-G92,G93.0, G93.2-G93.9,G95-G98	323-334,335.1-342,344-348.0, 348.2-359,435	145	126	1.1508	0.0532	4.6	1.0466	1.2550
Diseases of the ear and mastoid process . . . . .	H60-H93	380-389	*	*	*	*	*	*	*
Diseases of the circulatory system. . . . .	I00-I99	390-434,436-459	419	587	0.7138	0.0244	3.4	0.6659	0.7617
Pulmonary heart disease and diseases of pulmonary circulation . . . . .	I26-I28	415-417	138	123	1.1220	0.0447	4.0	1.0342	1.2097
Pericarditis, endocarditis and myocarditis . . . . .	I30,I33,I40	420-422	*	*	*	*	*	*	*
Cardiomyopathy . . . . .	I42	425	82	84	0.9762	0.0166	1.7	0.9436	1.0088
Cardiac arrest . . . . .	I46	427.5	25	87	0.2874	0.0508	17.7	0.1878	0.3869
Cerebrovascular diseases . . . . .	I60-I69	430-434,436-438	77	163	0.4724	0.0510	10.8	0.3725	0.5723
All other diseases of circulatory system . . . . .	I00-I25,I31,I34-I38,I44-I45, I47-I51,I70-I99	390-414,423-424,426-427.4, 427.6-429,440-459	88	123	0.7154	0.0519	7.3	0.6137	0.8172
Disease of the respiratory system . . . . .	J00-J98	034.0,460-519	420	516	0.8140	0.0220	2.7	0.7709	0.8570
Acute upper respiratory infections. . . . .	J00-J06	034.0,460-465	*	*	*	*	*	*	*
Influenza and pneumonia . . . . .	J10-J18	480-487	231	303	0.7624	0.0261	3.4	0.7112	0.8135
Influenza . . . . .	J10-J11	487	*	*	*	*	*	*	*
Pneumonia . . . . .	J12-J18	480-486	224	295	0.7593	0.0266	3.5	0.7072	0.8114
Acute bronchitis and acute bronchiolitis . . . . .	J20-J21	466	33	41	0.8049	0.0758	9.4	0.6563	0.9534
Bronchitis, chronic and unspecified . . . . .	J40-J42	490-491	*	*	*	*	*	*	*
Asthma . . . . .	J45-J46	493	*	*	*	*	*	*	*
Pneumonitis due to solids and liquids . . . . .	J69	507	*	*	*	*	*	*	*
Other and unspecified diseases of respiratory system . . . . .	J22,J30-J39,J43-J44,J47-J68,J70-J98	470-479,492,494-506,508-519	117	127	0.9213	0.0632	6.9	0.7973	1.0452
Diseases of the digestive system . . . . .	K00-K92	520-579	278	167	1.6647	0.1084	6.5	1.4521	1.8772
Gastritis, duodenitis, and noninfective enteritis and colitis . . . . .	K29,K50-K55	535, 555-558	137	47	2.9149	0.3879	13.3	2.1547	3.6751
Hernia of abdominal cavity and intestinal obstruction without hernia . . . . .	K40-K46,K56	550-553,560	*	*	*	*	*	*	*
All other and unspecified diseases of digestive system . . . . .	K00-K28,K30-K38,K57-K92	520-534,536-543,562-579	84	86	0.9767	0.0708	7.3	0.8379	1.1156
Diseases of the genitourinary system . . . . .	N00-N98	580-629	117	117	1.0000	0.0567	5.7	0.8889	1.1111
Renal failure and other disorders of kidney . . . . .	N17-N19,N25,N27	584-589	102	98	1.0408	0.0658	6.3	0.9118	1.1699
Other and unspecified diseases of genitourinary system . . . . .	N00-N15,N20-N23,N26,N28-N98	580-583,590-629	*	*	*	*	*	*	*
Certain conditions originating in the perinatal period . . . . .	P00-P96	760-771.2,771.4-779	10,047	9,495	1.0581	0.0032	0.3	1.0519	1.0643

See footnotes at end of table.

**Table III. Comparable category codes and estimated comparability ratios for 130 selected causes of infant death according to the Ninth and Tenth Revisions, *International Classification of Diseases*—Con.**

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
Newborn affected by maternal factors and by complications of pregnancy, labor and delivery . . . . .	P00–P04	760–763	1,305	1,256	1.0390	0.0099	1.0	1.0196	1.0585
Newborn affected by maternal hypertensive disorders . . . . .	P00.0	760.0	23	22	1.0455	0.0465	4.4	0.9544	1.1365
Newborn affected by other maternal conditions which may be unrelated to present pregnancy . . . . .	P00.1–P00.9	760.1–760.6,760.8–760.9	*	*	*	*	*	*	*
Newborn affected by maternal complications of pregnancy . . . . .	P01	761	662	643	1.0295	0.0138	1.3	1.0024	1.0567
Newborn affected by incompetent cervix . . . . .	P01.0	761.0	205	201	1.0199	0.0188	1.8	0.9831	1.0567
Newborn affected by premature rupture of membranes . . . . .	P01.1	761.1	314	307	1.0228	0.0136	1.3	0.9962	1.0494
Newborn affected by multiple pregnancy . . . . .	P01.5	761.5	104	103	1.0097	0.0507	5.0	0.9103	1.1091
Newborn affected by other maternal complications of pregnancy . . . . .	P01.2–P01.4,P01.6–P01.9	761.2–761.4,761.6–761.9	39	32	1.2188	0.1655	13.6	0.8945	1.5430
Newborn affected by complications of placenta, cord and membranes . . . . .	P02	762	579	553	1.0470	0.0128	1.2	1.0219	1.0721
Newborn affected by complications involving placenta . . . . .	P02.0–P02.3	762.0–762.3	306	285	1.0737	0.0174	1.6	1.0395	1.1079
Newborn affected by complications involving cord . . . . .	P02.4–P02.6	762.4–762.6	*	*	*	*	*	*	*
Newborn affected by chorioamnionitis . . . . .	P02.7	762.7	258	255	1.0118	0.0163	1.6	0.9799	1.0436
Newborn affected by other and unspecified abnormalities of membranes . . . . .	P02.8–P02.9	762.8–762.9	*	*	*	*	*	*	*
Newborn affected by other complications of labor and delivery . . . . .	P03	763.0–763.4,763.6–763.9	37	20	1.8500	0.3262	17.6	1.2107	2.4893
Newborn affected by noxious influences transmitted via placenta or breast milk . . . . .	P04	760.7, 763.5	*	*	*	*	*	*	*
Disorders related to length of gestation and fetal malnutrition . . . . .	P05–P08	764–766	3,843	3,474	1.1062	0.0064	0.6	1.0936	1.1188
Slow fetal growth and fetal malnutrition . . . . .	P05	764	34	30	1.1333	0.1004	8.9	0.9366	1.3301
Disorders related to short gestation and low birth weight, not elsewhere classified . . . . .	P07	765	3,809	3,444	1.1060	0.0064	0.6	1.0934	1.1186
Extremely low birth weight or extreme immaturity . . . . .	P07.0,P07.2	765.0	2,835	2,558	1.1083	0.0079	0.7	1.0927	1.1239
Other low birth weight or preterm . . . . .	P07.1,P07.3	765.1	974	886	1.0993	0.0135	1.2	1.0729	1.1258
Disorders related to long gestation and high birth weight . . . . .	P08	766	*	*	*	*	*	*	*
Birth trauma . . . . .	P10–P15	767	5	113	0.0442	0.0197	44.5	0.0056	0.0829
Intrauterine hypoxia and birth asphyxia . . . . .	P20–P21	768	401	277	1.4477	0.0599	4.1	1.3303	1.5650
Intrauterine hypoxia . . . . .	P20	768.2–768.4	57	63	0.9048	0.1227	13.6	0.6643	1.1452
Birth asphyxia . . . . .	P21	768.5–768.9	344	214	1.6075	0.0763	4.7	1.4579	1.7571
Respiratory distress of newborn . . . . .	P22	769	917	894	1.0257	0.0131	1.3	1.0001	1.0513
Other respiratory conditions originating in the perinatal period . . . . .	P23–P28	770	1,160	1,372	0.8455	0.0216	2.6	0.8032	0.8878
Congenital pneumonia . . . . .	P23	770.0	57	15	3.8000	0.9004	23.7	2.0352	5.5648
Neonatal aspiration syndromes . . . . .	P24	770.1	78	56	1.3929	0.1115	8.0	1.1743	1.6114
Interstitial emphysema and related conditions originating in the perinatal period . . . . .	P25	770.2	146	121	1.2066	0.0595	4.9	1.0899	1.3233

See footnotes at end of table.

**Table III. Comparable category codes and estimated comparability ratios for 130 selected causes of infant death according to the Ninth and Tenth Revisions, *International Classification of Diseases—Con.***

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
Pulmonary hemorrhage originating in the perinatal period . . . . .	P26	770.3	212	145	1.4621	0.0751	5.1	1.3150	1.6092
Chronic respiratory disease originating in the perinatal period . . . . .	P27	770.7	243	214	1.1355	0.0327	2.9	1.0715	1.1995
Atelectasis . . . . .	P28.0-P28.1	770.4-770.5	382	185	2.0649	0.1144	5.5	1.8406	2.2891
All other respiratory conditions originating in the perinatal period . . . . .	P28.2-P28.9	770.6-770.8	42	636	0.0660	0.0101	15.2	0.0463	0.0858
Infections specific to the perinatal period . . . . .	P35-P39	771.0-771.2,771.4-771.8	563	552	1.0199	0.0261	2.6	0.9688	1.0710
Bacterial sepsis of newborn . . . . .	P36	771.8	470	514	0.9144	0.0272	3.0	0.8611	0.9677
Omphalitis of newborn with or without mild hemorrhage . . . . .	P38	771.4	*	*	*	*	*	*	*
All other infections specific to the perinatal period . . . . .	P35,P37,P39	771.0-771.2,771.5-771.7	93	38	2.4474	0.3705	15.1	1.7211	3.1736
Hemorrhagic and hematological disorders of newborn . . . . .	P50-P61	772-774, 776	390	274	1.4234	0.0640	4.5	1.2979	1.5488
Neonatal hemorrhage . . . . .	P50-P52,P54	772	319	222	1.4369	0.0698	4.9	1.3002	1.5737
Hemorrhagic disease of newborn . . . . .	P53	776.0	*	*	*	*	*	*	*
Hemolytic disease of newborn due to isoimmunization and other perinatal jaundice . . . . .	P55-P59	773-774	*	*	*	*	*	*	*
Hematological disorders . . . . .	P60-P61	776.1-776.9	*	*	*	*	*	*	*
Syndrome of infant of a diabetic mother and neonatal diabetes mellitus . . . . .	P70.0-P70.2	775.0-775.1	*	*	*	*	*	*	*
Necrotizing enterocolitis of newborn . . . . .	P77	777.5	249	203	1.2266	0.0456	3.7	1.1371	1.3161
Hydrops fetalis not due to hemolytic disease . . . . .	P83.2	778.0	120	120	1.0000	0.0264	2.6	0.9483	1.0517
Other perinatal conditions . . . . .	P29,P70.3-P76,P78-P81,P83.0-P83.1 P83.3-P96	775.2-775.9,777.0-777.4,777.6-777.9, 778.1-779	1,092	954	1.1447	0.0192	1.7	1.1070	1.1823
Congenital malformations, deformations and chromosomal abnormalities . . . . .	Q00-Q99	740-759	3,400	3,751	0.9064	0.0057	0.6	0.8953	0.9176
Anencephaly and similar malformations . . . . .	Q00	740	299	299	1.0000	0.0000	0.0	1.0000	1.0000
Congenital hydrocephalus . . . . .	Q03	742.3	62	91	0.6813	0.0552	8.1	0.5732	0.7895
Spina bifida . . . . .	Q05	741	24	32	0.7500	0.0765	10.2	0.6000	0.9000
Other congenital malformations of nervous system . . . . .	Q01-Q02,Q04,Q06-Q07	742.0-742.2,742.4-742.9	191	177	1.0791	0.0477	4.4	0.9856	1.1725
Congenital malformations of heart . . . . .	Q20-Q24	745-746	1,022	1,027	0.9951	0.0081	0.8	0.9793	1.0109
Other congenital malformations of circulatory system . . . . .	Q25-Q28	747	75	121	0.6198	0.0504	8.1	0.5210	0.7186
Congenital malformations of respiratory system . . . . .	Q30-Q34	748	361	571	0.6322	0.0225	3.6	0.5882	0.6762
Congenital malformations of digestive system . . . . .	Q35-Q45	749-751	*	*	*	*	*	*	*
Congenital malformations of genitourinary system . . . . .	Q50-Q64	752-753	216	229	0.9432	0.0244	2.6	0.8955	0.9910
Congenital malformations and deformations of musculoskeletal system, limbs and integument . . . . .	Q65-Q85	754-757	269	311	0.8650	0.0319	3.7	0.8024	0.9275
Down's syndrome . . . . .	Q90	758.0	57	58	0.9828	0.0705	7.2	0.8446	1.1209
Edward's syndrome . . . . .	Q91.0-Q91.3	758.2	277	278	0.9964	0.0080	0.8	0.9807	1.0121
Patau's syndrome . . . . .	Q91.4-Q91.7	758.1	170	173	0.9827	0.0099	1.0	0.9632	1.0021
Other congenital malformations and deformations . . . . .	Q10-Q18,Q86-Q89	743-744,759	304	312	0.9744	0.0210	2.2	0.9332	1.0155
Other chromosomal abnormalities, not elsewhere classified . . . . .	Q92-Q99	758.3-758.9	57	53	1.0755	0.0783	7.3	0.9221	1.2289

See footnotes at end of table.



**Table III. Comparable category codes and estimated comparability ratios for 130 selected causes of infant death according to the Ninth and Tenth Revisions, *International Classification of Diseases—Con.***

Cause of death (Based on the <i>Tenth Revision, International Classification of Diseases, 1992</i> )	Category codes according to the Tenth Revision (ICD-10)	Category codes according to the Ninth Revision (ICD-9)	Number of deaths allocated according to		Estimated comparability ratio	Standard error	Relative standard error	95-percent confidence limits	
			Tenth Revision	Ninth Revision				Lower	Upper
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified . . . . .	R00-R99	780-799	2,799	2,732	1.0245	0.0042	0.4	1.0163	1.0327
Sudden infant death syndrome . . . . .	R95	798.0	2,575	2,485	1.0362	0.0040	0.4	1.0284	1.0440
Other symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified . . . . .	R00-R53,R55-R594,R96-R99	780-796,798.1-799	224	247	0.9069	0.0270	3.0	0.8540	0.9598
All other diseases . . . . .	F01-F99,H00-H57,L00-M99	290-319,360-379,680-739	*	*	*	*	*	*	*
External causes of mortality . . . . .	V01-Y84	E800-E999	441	444	0.9932	0.0098	1.0	0.9741	1.0124
Accidents (unintentional injuries) . . . . .	V01-X59	E800-E869,E880-E929	292	285	1.0246	0.0107	1.0	1.0037	1.0454
Transport accidents . . . . .	V01-V99	E800-E848,E920-E929.1	99	108	0.9167	0.0294	3.2	0.8590	0.9743
Motor vehicle accidents . . . . .	V02-V04,V09.0,V09.2,V12-V14, V19.0-V19.2,V19.4-V19.6,V20-V79, V80.3-V80.5,V81.0-V81.1, V82.0-V82.1,V83-V86,V87.0-V87.8, V88.0-V88.8,V89.0,V89.2	E810-E825	95	98	0.9694	0.0176	1.8	0.9349	1.0039
Other and unspecified transport accidents . . . . .	V01,V05-V06,V09.1,V09.3-V09.9, V10-V11,V15-V18,V19.3,V19.8, V19.9,V80.0-V80.2,V80.6-V80.9, V81.2-V81.9,V82.2-V82.9,V87.9, V88.9,V89.1,V89.3,V89.9,V90-V99	E800-E807,E826-E848,E929.1	*	*	*	*	*	*	*
Falls . . . . .	W00-W19	E880-E888	*	*	*	*	*	*	*
Accidental discharge of firearms . . . . .	W32-W34	E922	*	*	*	*	*	*	*
Accidental drowning and submersion . . . . .	W65-W74	E910	*	*	*	*	*	*	*
Accidental suffocation and strangulation in bed . . . . .	W75	E913.0	*	*	*	*	*	*	*
Other accidental suffocation and strangulation . . . . .	W76-W77,W81-W84	E913.1-E913.9	79	69	1.1449	0.0537	4.7	1.0396	1.2502
Accidental inhalation and ingestion of food or other objects causing obstruction of respiratory tract . . . . .	W78-W80	E911-E912	32	29	1.1034	0.0810	7.3	0.9447	1.2622
Accidents caused by exposure to smoke, fire and flames . . . . .	X00-X09	E890-E899	*	*	*	*	*	*	*
Accidental poisoning and exposure to noxious substances . . . . .	X40-X49	E850-E869,E924.1	*	*	*	*	*	*	*
Other and unspecified accidents . . . . .	W20-W31,W35-W64,W85-W99, X10-X39,X50-X59	E900-E909,E914-E921,E923-E924.0, E924.8-E929	*	*	*	*	*	*	*
Assault (homicide) . . . . .	X85-Y09	E960-E968	146	154	0.9481	0.0179	1.9	0.9130	0.9831
Assault (homicide) by hanging, strangulation and suffocation . . . . .	X91	E963	*	*	*	*	*	*	*
Assault (homicide) by discharge of firearms . . . . .	X93-X95	E965.0-E965.4	*	*	*	*	*	*	*
Neglect, abandonment and other maltreatment syndromes . . . . .	Y06-Y07	E967,E968.4	*	*	*	*	*	*	*
Assault (homicide) by other and unspecified means . . . . .	X85-X90,X92,X96-X99,Y00-Y05, Y08-Y09	E960-E962,E964,E965.5-E966, E968.0-E968.3, E968.8-E968.9	91	88	1.0341	0.0417	4.0	0.9524	1.1158
Complications of medical and surgical care . . . . .	Y40-Y84	E870-E879,E930-E949	*	*	*	*	*	*	*
Other external causes . . . . .	X60-X84,Y10-Y36	E970-E979	*	*	*	*	*	*	*

\* Figure does not meet standards of reliability or precision; see Technical notes.  
0.0 Quantity more than zero but less than 0.05.

of this increase (about 95 percent) comes from deaths that were classified in ICD-9 as Presenile dementia (ICD-9 code 290.1).

The application of the comparability ratio presented for Alzheimer's disease to years later than 1996 may substantially underestimate the increase in Alzheimer's disease due to ICD-10. Increases in the reporting of Alzheimer's-type dementia have occurred since 1996, resulting in substantial increases in Presenile dementia from 1996 to 1998. The number of Alzheimer's disease deaths increased by about 1,000 deaths between 1996 and 1997, slowing to an increase of about 300 between 1997 and 1998. In contrast, the increase in Presenile dementia was more substantial, about 2,000 deaths each year. If the comparability ratio were based on 1998 data it would probably be at least 1.69 (approximating the ICD-10-classified Alzheimer's disease deaths by adding the Alzheimer's disease and Presenile dementia deaths). Assuming proportionately similar increases in the ICD-9 classification of Alzheimer's disease and Presenile dementia from 1998 to 1999, the comparability ratio based on 1999 data could be as high as 1.8 or 1.9. As a consequence, the reported increase in mortality for Alzheimer's disease in [table D](#) is overstated considerably.

*Nephritis, nephrotic syndrome and nephrosis, and Renal failure* ([table 2](#))—Nephritis, nephrotic syndrome and nephrosis (ICD-10 codes N00–N07, N17–N19, N25–N27) has a comparability ratio of 1.2320 ([table II](#)). The 23-percent increase in this category is due primarily to changes in the classification of Renal failure (ICD-10 codes N17–N19), which has a comparability ratio of 1.2949. End-stage renal disease, which was classified as an unspecified disorder of the kidney in ICD-9 (ICD-9 code 593.9) (grouped with All other diseases), has been reclassified in ICD-10 as End-stage renal disease (ICD-10 code N18.0), a subcategory of Renal failure (N17–N19). This results in adding a substantial number of deaths to the Renal failure and Nephritis, nephrotic syndrome and nephrosis categories.

When applied to years later than 1996, the comparability ratios for Nephritis, nephrotic syndrome and nephrosis, and Renal failure presented in this report may underestimate the increase in these causes due to ICD-10. From 1996 to 1999 reporting of End-stage renal disease increased by about 1,900 deaths. This increase disproportionately affects the numerator of the comparability ratio since End-stage renal disease is included with Renal failure in ICD-10, but not in ICD-9. Thus, the numerator of the comparability ratio should probably be larger by roughly 1,900 deaths giving a comparability ratio about 1.4 for Renal failure and about 1.3 for Nephritis, nephrotic syndrome and nephrosis.

*Pregnancy, childbirth and the puerperium* ([table 2](#))—The large increase in the number of deaths attributable to Pregnancy, childbirth and the puerperium (ICD-10 codes O00–O99) is due to a selection rule change in ICD-10 (17).

*Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified* ([table 2](#))—The large increase in the number of deaths attributable to Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (ICD-10 codes R00–R99) is due to late receipt of additional updated information from the States to NCHS. Updated information not received in time for the preliminary report will be included in the 1999 final mortality report, in which this number of deaths will decrease.

*Motor vehicle accidents and Other land transport accidents* ([table 2](#))—The preliminary comparability ratio for Motor vehicle accidents shown in [table II](#) (0.9754) is different from that shown in the report *Comparability of cause-of-death between ICD-9 and ICD-10:*

*Preliminary Estimates* (9). For a death to be classified as a Motor vehicle accident in ICD-10, it must be explicit that the injury involved a "motor" vehicle. In ICD-9, in the absence of the term "motor" or when a vehicle accident was reported as occurring on a highway or road, the assumption was to classify the accident as involving a motor vehicle. ICD-10 does not allow this assumption and classifies such accidents as involving unspecified vehicles (categorized in ICD-10 as Other land transport accidents). However, for U.S. data it has been decided that, if an accident occurred on a highway or road, classification to Motor vehicle accident is appropriate. This change has been made in this report. Taking into account this change in classification results in a revised comparability ratio for Motor vehicle accidents. This ratio is only applicable to data in which the aforementioned classification change was implemented. It is possible that some States may have released data that does not include this change.

*Diarrhea and gastroenteritis of infectious origin* ([table 5](#))—The apparent elimination of infant deaths due to Diarrhea and gastroenteritis of infectious origin (ICD-10 code A09) was not due to a program error, but occurred because in ICD-10, for developed countries, diarrhea or gastroenteritis is presumed to be noninfectious unless specified otherwise. In ICD-9, the presumption was that the disease was infectious when unspecified. Records coded in ICD-9 to ICD-9 code 009.0 (Infectious colitis, enteritis, and gastroenteritis) are reclassified in ICD-10 to noninfectious causes.

*Birth trauma* ([table 5](#))—For newborns, cerebral hemorrhage either unspecified or due to birth injury, anoxia, or hypoxia was classified in ICD-9 to a birth injury or trauma (ICD-9 code 767.0, Subdural and cerebral hemorrhage). In ICD-10, for the cerebral hemorrhage to be classified as birth injury (ICD-10 code P10.0, Subdural hemorrhage due to birth injury), the certifier must specify that there was a birth injury. Cerebral hemorrhages either unspecified or due to anoxia or hypoxia are classified as nontraumatic. Nearly all of the Birth trauma (ICD-10 codes P10–P15) cases are reclassified to nontraumatic causes. Because the resulting numerator of the comparability ratio is based on a very small number, the comparability-modified figures for this cause are highly unstable.

*Atelectasis* ([table 5](#))—In ICD-10, when hypoplasia or dysplasia of lung is mentioned on the death certificate with prematurity or short gestation, the appropriate classification is Primary atelectasis of newborn (ICD-10 codes P28.0–P28.1) rather than Hypoplasia and dysplasia of lung (ICD-10 code Q33.6). Due to this coding change, the number of deaths classified to Atelectasis increased substantially in 1999.

*Sudden infant death syndrome (SIDS)* ([table 5](#))—The large decrease in the number of deaths attributable to SIDS (ICD-10 code R95) is partially due to the change in the way SIDS is diagnosed in the medical community. Many of these deaths have been classified to the category Other symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified.

## Computing rates

Except for infant mortality rates, rates are on an annual basis per 1,000 or per 100,000 estimated population residing in the specified area as of July 1, 1999, and July 1, 1998, and are based on populations furnished by the U.S. Bureau of the Census (23, 24).

Infant mortality rates are per 1,000 or per 100,000 live births. Rates by State are computed on the basis of populations on July 1, 1999, and July 1, 1998 (25, 26).

Age-adjusted rates are used to compare relative mortality risks among groups and over time. However, they should be viewed as relative indexes rather than as actual measures of mortality risk. They were computed by the direct method, that is, by applying age-specific death rates to the U.S. standard population (relative age distribution of year 2000 projected population of the United States) using the following age groups:

Age	Number	Weights ( $w_i$ )
All ages	1,000,000	1.000000
Under 1 year	13,818	0.013818
1-4 years	55,317	0.055317
5-14 years	145,565	0.145565
15-24 years	138,646	0.138646
25-34 years	135,573	0.135573
35-44 years	162,613	0.162613
45-54 years	134,834	0.134834
55-64 years	87,247	0.087247
65-74 years	66,037	0.066037
75-84 years	44,842	0.044842
85 years and over	15,508	0.015508

Age-adjusted death rates for Puerto Rico, the Virgin Islands, Guam, American Samoa, and Northern Marianas were computed using the following age groups:

Age	Number	Weights ( $w_i$ )
All ages	1,000,000	1.000000
Under 1 year	13,818	0.013818
1-4 years	55,317	0.055317
5-14 years	145,565	0.145565
15-24 years	138,646	0.138646
25-34 years	135,573	0.135573
35-44 years	162,613	0.162613
45-54 years	134,834	0.134834
55-64 years	87,247	0.087247
65-74 years	66,037	0.066037
75 years and over	60,350	0.060350

Effective with 1999 mortality data, the standard population was changed from 1940 to the year 2000 population in accordance with new statistical policy promulgated by the Secretary of Health and Human Services in August 1998 (6). The new population standard affects levels of mortality and to some extent trends and group comparisons. Of particular note are the effects on race comparison of mortality. For detailed discussion see *Age Standardization of Death Rates: Implementation of the Year 2000 Standard* (6).

Death rates for the Hispanic population are based only on events to persons reported as Hispanic. Rates for non-Hispanic white persons are based on the sum of all events to white decedents reported as non-Hispanic and white decedents with origin not stated. Hispanic origin is not imputed if it is not reported. For calculating death rates, deaths with age not stated are not distributed. The number of deaths with age not stated was 356, or less than 0.02 percent of all deaths.

An asterisk (\*) indicates that the figure does not meet standards of reliability or precision. In this report three sets of criteria determine whether a figure meets these standards:

- The State-specific sample is complete enough to provide reliable estimates. For example, at least 75 percent of a State's records

for the 12-month period is used as a basis for providing State-specific estimates (see [table I](#)). In this report all States met this criterion.

- Reporting for any particular variable is at least 80-percent complete. In this report no data were suppressed based on this criterion.
- A rate is based on at least 20 deaths.

Rates based on fewer than 20 deaths have a relative standard error (RSE) of about 23 percent or more and, therefore, are considered highly variable. For age-adjusted death rates, this criterion is applied to the sum of the age-specific deaths. However, some death rates (based on data files that are less than 100 percent complete and based on 20-31 deaths) may have RSE's of 23 percent or more but are still shown instead of asterisks. As a result, caution should be exercised in analyzing rates based on 20-31 events. Additional information on random variation in numbers of events, rates, ratios, and percents may be found in sections on "Reliability of estimates for demographic data" and/or "Reliability of estimates for cause-of-death data."

### Reliability of estimates for demographic data

Because the preliminary estimates of deaths in this report are based on files that may not be complete, they are treated as if they were subject to sampling variability. The notion of the sample is reflected in the record weights that are used to adjust record counts to independent control totals. The lack of completeness of the vital statistics files is due to delays in receiving and processing the death records.

In addition, the mortality files are subject to nonsampling errors or biases. Records that were delayed and were not included in this report are assumed to have the same characteristics as the records that were included in this report. However, this assumption may be violated in the relatively small number of records where cause of death is pending investigation (for example, homicides, suicides, unintentional injuries, and SIDS) or in the causes of death that were rejected by the automated mortality coding systems for manual processing. Seasonal bias may occur because file completeness is greater during the earlier part than during the later part of the 12-month period for which the data are processed and tabulated.

Even where the number of vital events in this report is 100 percent complete and not subject to sampling variability, it might be affected by random variation. Thus, when the number of events is small and the probability of such an event is small, considerable caution must be observed in interpreting the data. Such infrequent events may be assumed to follow a Poisson probability distribution. The first column of [table IV](#) shows the estimated RSE's of a file that is nearly 100 percent complete. The estimated RSE's of the 1998 final data, the preliminary 1999 control totals, and the preliminary 1999 data (based on nearly 100 percent of a file) are shown in the first column of [table IV](#).

Data based on a sample, that is, where the file is less than 100 percent complete, are affected by sampling variation as well as by random variation. The estimated RSE's in columns 2-6 of [table IV](#) for various levels of file completeness are measures of the sampling errors and the random errors of the estimates.

**Table IV. Relative standard errors for preliminary number of deaths by percent of file completeness**

[Relative standard errors are expressed as a percent of the estimate]

Estimated number of deaths	Percent of file completeness					
	100	95	90	80	70	60
	Relative standard error (percent)					
1..	100.0	102.6	105.4	111.8	119.5	129.1
5..	44.7	45.9	47.1	50.0	53.5	57.7
10..	31.6	32.4	33.3	35.4	37.8	40.8
20..	22.4	22.9	23.6	25.0	26.7	28.9
30..	18.3	18.7	19.2	20.4	21.8	23.6
40..	15.8	16.2	16.7	17.7	18.9	20.4
50..	14.1	14.5	14.9	15.8	16.9	18.3
60..	12.9	13.2	13.6	14.4	15.4	16.7
70..	12.0	12.3	12.6	13.4	14.3	15.4
80..	11.2	11.5	11.8	12.5	13.4	14.4
90..	10.5	10.8	11.1	11.8	12.6	13.6
100..	10.0	10.3	10.5	11.2	12.0	12.9
200..	7.1	7.3	7.5	7.9	8.5	9.1
300..	5.8	5.9	6.1	6.5	6.9	7.5
400..	5.0	5.1	5.3	5.6	6.0	6.5
500..	4.5	4.6	4.7	5.0	5.3	5.8
600..	4.1	4.2	4.3	4.6	4.9	5.3
700..	3.8	3.9	4.0	4.2	4.5	4.9
800..	3.5	3.6	3.7	4.0	4.2	4.6
900..	3.3	3.4	3.5	3.7	4.0	4.3
1,000..	3.2	3.2	3.3	3.5	3.8	4.1
2,000..	2.2	2.3	2.4	2.5	2.7	2.9
5,000..	1.4	1.5	1.5	1.6	1.7	1.8
10,000..	1.0	1.0	1.1	1.1	1.2	1.3
20,000..	0.7	0.7	0.7	0.8	0.8	0.9
50,000..	0.4	0.5	0.5	0.5	0.5	0.6
100,000..	0.3	0.3	0.3	0.4	0.4	0.4
200,000..	0.2	0.2	0.2	0.2	0.3	0.3
500,000..	0.1	0.1	0.1	0.2	0.2	0.2
1,000,000..	0.1	0.1	0.1	0.1	0.1	0.1
2,000,000..	0.1	0.1	0.1	0.1	0.1	0.1
4,000,000..	0.1	0.1	0.1	0.1	0.1	0.1

The estimated RSE's in table IV were computed using this formula:

$$1. \text{ RSE} = 100 \sqrt{\frac{1}{\bar{X}} + \frac{(1-f)(N-X)}{fX(N-1/f)}}$$

where

$f$  = the sampling fraction or the percent of file completeness/100 from table I. For mortality data based on deaths under 1 year of age, use the  $f$  for "infant deaths" for either the demographic or medical file as appropriate. For mortality data based on all ages combined or any age group that is 1 year and over, use the  $f$  for "deaths 1 year of age and over" for either the demographic or medical files as appropriate.

$X$  = the estimated number of infant deaths or deaths.

$N$  = the total count of infant deaths or deaths for the United States or any State. (Note: The RSE's shown in table IV are based on  $N = 4,000,000$ . If  $N$  is smaller, the RSE's may be slightly smaller than those shown.)

RSE's may be used to compute 95-percent confidence intervals for the number of events ( $X$ ), for a rate ( $R$ ), or for a percent ( $P$ ) and

to compute statistical tests concerning the equality of two rates ( $R_1$  and  $R_2$ ) or two percents ( $P_1$  and  $P_2$ ).

For the number of deaths, the 95-percent confidence interval may be computed as follows:

$$2. \text{ Lower limit: } X_1 - \left( 1.96 \cdot X_1 \cdot \frac{\text{RSE}(X_1)}{100} \right)$$

$$3. \text{ Upper limit: } X_1 + \left( 1.96 \cdot X_1 \cdot \frac{\text{RSE}(X_1)}{100} \right)$$

As a hypothetical example, assume the number of deaths,  $X_1$ , is 70 from a file with 80 percent completeness. Then

$$\text{Lower limit: } 70 - \left( 1.96 \cdot 70 \cdot \frac{13.4}{100} \right) = 51.6$$

$$\text{Upper limit: } 70 + \left( 1.96 \cdot 70 \cdot \frac{13.4}{100} \right) = 88.4$$

This means that the chances are 95 times in 100 that the confidence interval (51.6–88.4) will cover the "true" number of deaths.

For rates based on population estimates in the denominator, the 95-percent confidence interval may be computed as follows:

4. Lower limit:  $R_1 - \left(1.96 \cdot R_1 \cdot \frac{RSE(R_1)}{100}\right)$   
 5. Upper limit:  $R_1 + \left(1.96 \cdot R_1 \cdot \frac{RSE(R_1)}{100}\right)$

As a hypothetical example, assume the death rate,  $R_1$ , is 20.0, which is based on 70 deaths from a file with 80 percent completeness. Then

Lower limit:  $20.0 - \left(1.96 \cdot 20.0 \cdot \frac{13.4}{100}\right) = 14.7$   
 Upper limit:  $20.0 + \left(1.96 \cdot 20.0 \cdot \frac{13.4}{100}\right) = 25.3$

This means that the chances are 95 times in 100 that the confidence interval (14.7–25.3) will cover the “true” rate.

For age-adjusted death rates,  $R'$ , the 95-percent confidence interval may be computed as follows:

6. Lower limit:  $R' - \left(1.96 \cdot R' \cdot \frac{RSE(R')}{100}\right)$   
 7. Upper limit:  $R' + \left(1.96 \cdot R' \cdot \frac{RSE(R')}{100}\right)$

where

8.  $RSE(R') = 100 \sqrt{\frac{\sum_i \left\{ w_i^2 R_i^2 \left[ \frac{1}{X_i} + \frac{(1-f_i)(N_i - X_i)}{f_i X_i (N_i - \frac{1}{f_i})} \right] \right\}}{R'^2}}$

where

- $i$  = each age group where  $i = 1$  for infant deaths,  $i = 2$  for 1–4 years,  $i = 3$  for 5–14 years, . . . and  $i = 11$  for 85 years and over
- $R_i$  = age-specific rate for the  $i$ th age group
- $w_i$  =  $i$ th age-specific U.S. standard population such that  $\sum w_i = 1.000000$  (see “Computing rates”)
- $X_i$  = the estimated number of deaths for the  $i$ th age group
- $N_i$  = the total count of deaths from table I for each  $i$ th age group (for infant deaths, use the count of records as shown; for all age groups 1–4 through 85 years and over, use the count of records as shown for deaths 1 year and over)
- $f_i$  = percent of file completeness/100 from table I (for infant deaths, use the percent completeness for the demographic or medical file as appropriate for deaths under age 1 year; for all age groups 1–4 through 85 years and over, use the percent completeness for the demographic or medical file as appropriate for deaths 1 year and over)

For testing the equality of two rates,  $R_1$  and  $R_2$ , the following z-test may be used to define a significance test statistic:

9.  $z = \frac{R_1 - R_2}{\sqrt{R_1^2 \left(\frac{RSE(R_1)}{100}\right)^2 + R_2^2 \left(\frac{RSE(R_2)}{100}\right)^2}}$

The two-tailed 0.95 critical value for a z statistic is 1.96. Therefore, if  $|z| \geq 1.96$ , the difference is significant at the 0.05 level. If  $|z| < 1.96$ , then the difference would be considered not statistically significant at the 0.05 level.

As a hypothetical example, assume  $R_1$  is the same as the above example for the current 12-month period and that  $R_2$ , 15.0, is based on 50 deaths occurring in the prior 12-month period (which implies that the file is approximately 100 percent complete for  $R_2$ ). The z-test may be determined as follows:

$z = \frac{20.0 - 15.0}{\sqrt{(20.0)^2 \left(\frac{13.4}{100}\right)^2 + (15.0)^2 \left(\frac{14.1}{100}\right)^2}} = 1.46$

Because  $|z| < 1.96$ , there is not a statistically significant difference between the two rates at the 0.05 level of significance.

For rates or percents based on denominators having random variation only or random and sampling variation, the RSE must take into account the variation in the numerator and denominator. For example, for a rate,  $R_3$ , based on the number of live births in the denominator, the RSE is computed as follows:

10.  $RSE(R_3) = 100 \sqrt{\frac{RSE(D)^2}{100} + \frac{RSE(B)^2}{100}}$

where

- $RSE(D)$  = RSE of the number of deaths,  $D$
- $RSE(B)$  = RSE of the number of births,  $B$

The 95-percent confidence interval of  $R_3$  may be computed as follows:

11. Lower limit:  $R_3 - \left(1.96 \cdot R_3 \cdot \frac{RSE(R_3)}{100}\right)$   
 12. Upper limit:  $R_3 + \left(1.96 \cdot R_3 \cdot \frac{RSE(R_3)}{100}\right)$

As a hypothetical example, assume the infant mortality rate,  $R_3$ , is 15.0, which is based on 30 infant deaths ( $D$ ) from a file with 70 percent completeness and 2,000 live births ( $B$ ) from a file with 80 percent completeness. Then

$RSE(R_3) = 100 \sqrt{\frac{(21.8)^2}{100} + \frac{(2.5)^2}{100}} = 21.9$

$$\text{Lower limit: } 15.0 - \left( 1.96 \cdot 15.0 \cdot \frac{21.9}{100} \right) = 8.6$$

$$\text{Upper limit: } 15.0 + \left( 1.96 \cdot 15.0 \cdot \frac{21.9}{100} \right) = 21.4$$

This means that the chances are 95 times in 100 that the confidence interval (8.6–21.4) will cover the "true" rate. The same formulas are applicable to a percent ( $P_1$ ) that has variation in the numerator and denominator. To compare the equality of two infant mortality rates or two percents that have variation in the numerator and denominator, the previously mentioned z-test may be used.

### Reliability of estimates for cause-of-death data

Since this preliminary file is virtually complete (over 99 percent of the file has been processed) the calculation of measures of variability using cause-of-death data will assume a 100-percent complete file. These measures are different from the previous measures in that they take into account the variability of the comparability ratio modified 1998 data in order for comparison with the 1999 data using cause of death. For additional information on the statistical tests below, please refer to *A Guide to State Implementation of ICD-10 for Mortality, Part II: Applying Comparability Ratios* (27) at the following Web site: <http://www.cdc.gov/nchs/about/major/dvs/icd10des.htm>

Two issues arise in the analysis of mortality data across the boundary of two ICD revisions (ICD-9 and ICD-10):

1. data presentation and analysis
2. statistical tests to ascertain whether the change in mortality between the last year of the old revision (1998) and the first year of the new revision (1999) is a statistically significant change

In terms of mortality data presentation by cause of death for 1999, this report publishes death rates for ICD-10 using the tabulation List of 113 Selected Causes of Death and the List of 130 Selected Causes of Infant Death. These death rates are compared with death rates for 1998 for the most nearly comparable ICD-9 titles (tables II and III) multiplied by the ICD-10:ICD-9 comparability ratios, and called "comparability-modified death rates." Also shown are the 1998 rates that are not comparability-modified (tables 2 and 5).

The second issue is determining whether the change in death rates between 1998 and 1999 was statistically significant, taking into account comparability. This is accomplished in a manner similar to statistical analysis of mortality trends within the same revision (2), but incorporating into the comparisons and the statistical tests explicit regard for comparability. This section focuses on presenting methods for analyzing differences in mortality *between* revisions. The key difference is that the latter analysis must take explicitly into account comparability ratios that measure the quantitative impact of the new revisions on causes of death.

Formulas shown below address the general problem of evaluating differences between two population-based death rates estimated for successive years, between revisions of the ICD. Rates used throughout the section are specific for cause of death. Rates computed using data from an initial year ( $R_1$ ) are assumed to be based on ICD-9, while those for the following year ( $R_2$ ) are assumed to be based on ICD-10. A comparability ratio ( $C$ ) measures the level of agreement between classification systems. The cause-specific comparability ratio will be

applied to  $R_1$  to adjust for the change in the way these deaths were classified for the later revision compared with the earlier revision. In addition to 1998 mortality data, this factor ( $C$ ) should also be applicable to at least 1994, 1995, 1996, and 1997. The comparability ratio needs to be considered in statistical tests that compare the changes in rates from one year to a subsequent one between revisions.

In applying the formulas, distinctions should be made for cases involving large (100 or more) and small (1–99) numbers of deaths. All formulas in this section are for cases involving large numbers of deaths (100 or more). Formulas for constructing 95 percent Confidence Intervals for small numbers of deaths are shown in the publication mentioned above (27).

The general formula for obtaining (estimated) RSE's for a point-estimate,  $\theta$  (like a comparability ratio), is the following:

$$13. \text{ RSE}(\hat{\theta}) = 100 \frac{S(\hat{\theta})}{\hat{\theta}}$$

where

$S(\theta)$  = standard error of Theta

The estimated RSE for an age-specific death rate or a crude death rate is given by the formula below:

$$14. \text{ RSE}(R) = \text{RSE}(D) = 100 \sqrt{\frac{1}{D}}$$

where

$R$  = the cause-specific death rate produced by dividing the number of deaths attributed to a given cause at a given time by the population-at-risk for that same time period

$D$  = the estimated number of deaths due to a given cause on a given time

The following procedures for constructing approximate 95 percent confidence intervals are ordered depending on whether the death rate was computed based on the recently introduced ICD-10 revision or on the previous (ICD-9) revision, respectively. The rate based on the ICD-9 revision is adjusted by the application of a cause-specific comparability ratio.

For an age-specific or crude death rate based on the ICD-10 revision, the 95-percent confidence interval may be captured as follows:

$$15. \text{ Lower limit: } R_3 - \left( 1.96 \cdot R_3 \cdot \frac{\text{RSE}(R_3)}{100} \right)$$

$$16. \text{ Upper limit: } R_3 + \left( 1.96 \cdot R_3 \cdot \frac{\text{RSE}(R_3)}{100} \right)$$

For an age-specific or crude death rate based on the ICD-9 revision, the 95 percent confidence interval may be captured as follows:

$$17. \text{ Lower limit: } C \cdot R_1 - \left( 1.96 \cdot C \cdot R_1 \cdot \frac{\text{RSE}(C \cdot R_1)}{100} \right)$$

$$18. \text{ Upper limit: } C \cdot R_1 + \left( 1.96 \cdot C \cdot R_1 \cdot \frac{\text{RSE}(C \cdot R_1)}{100} \right)$$

where

$R_2$  = death rate (per 100,000) computed for data year under ICD-10

$C$  = ICD-10:ICD-9 comparability ratio specific for the cause of death of interest

$R_1$  = death rate (per 100,000) computed for data year under ICD-9

Let us suppose that the respective ICD-9 and ICD-10 death rates for a cause of death were 11.7 ( $R_1$ ) and 6.2 ( $R_2$ ) per 100,000 population. The ICD-10:ICD-9 comparability ratio ( $C$ ) obtained for this cause was 1.060. Its standard error,  $S(C)$ , is 0.0096.

Assume that the numbers of deaths for this cause were 31,130 for ICD-9 and 16,516 for ICD-10. By inserting the number of deaths ( $D$ ) into formula 14, we obtain the RSE's for both yearly rates: 0.5668 for the ICD-9 rate and 0.7781 for the ICD-10 rate [RSE ( $R_1$ ) and RSE ( $R_2$ ), respectively].

By inserting the comparability ratio and its standard error into Formula 13, we obtain  $RSE(C) = (0.0096 / 1.060) \cdot 100 = 0.9057$ .

Since we wish to modify the ICD-9 rate ( $R_1$ ) to compensate for the difference in classification systems, we must multiply this rate times the comparability ratio  $C \cdot R_1 = 12.40$ . To obtain the standard error of this modified ICD-9 rate,  $S(C \cdot R_1)$ , we must refer to Formula 21. This formula requires knowing the RSE's for the ICD-9 rate and for the comparability ratio. By substituting these values into the formula, we have that  $RSE(C \cdot R_1) = 1.0684$ .

Lower 95-percent confidence interval limit for  $C \cdot R_1 = 12.40 - (1.96 \cdot 0.1325) = 12.14$ .

Upper 95-percent confidence interval limit for  $C \cdot R_1 = 12.40 + (1.96 \cdot 0.1325) = 12.66$ .

Lower 95-percent confidence interval limit for  $R_2 = 6.2 - (1.96 \cdot 0.0482) = 6.10$ .

Upper 95-percent confidence interval limit for  $R_2 = 6.2 + (1.96 \cdot 0.0482) = 6.29$ .

For testing the difference between two rates ( $R_1$  and  $R_2$ , each based on 100 or more deaths), the following z-test that considers the use of a comparability ratio applied to ICD-9 death rates may be used to define a significance test statistic:

$$19. z = \frac{C \cdot R_1 - R_2}{\sqrt{C^2 \cdot R_1^2 \left\{ \left( \frac{RSE(R_1)}{100} \right)^2 + \left( \frac{RSE(C)}{100} \right)^2 \cdot \left[ 1 + \left( \frac{RSE(R_1)}{100} \right)^2 \right] \right\} + R_2^2 \left( \frac{RSE(R_2)}{100} \right)^2}$$

where

$C$  = ICD-10:ICD-9 comparability ratio for the specific cause category

$R_1, R_2$  = cause-specific death rates based on ICD-9 and ICD-10 years, respectively

$RSE(R_1)$  = relative standard error of the ICD-9 cause-specific death rate

$RSE(R_2)$  = relative standard error of the ICD-10 cause-specific death rate

$RSE(C)$  = relative standard error of the ICD-10:ICD-9 comparability ratio specific for the cause of death

If  $|z| \geq 1.96$ , then the difference is statistically significant at the 0.05 level and if  $z < 1.96$ , the difference is not significant. For computing statistical tests when  $R_1$  and/or  $R_2$  are based on less than 100 deaths, see the Web site mentioned above (27).

For tables showing an age-adjusted death rate, ( $R'$ ), the RSE in formula 8 above would be substituted by this formula:

$$20. RSE(R'_2) = 100 \frac{\sqrt{\sum \left[ w_i^2 \cdot R_{i2}^2 \left( \frac{1}{D_{i2}} \right) \right]}}{R'_2}$$

where

$R'_2$  = age-adjusted death rate for a specific cause of interest, based on ICD-10

$i$  = each age group

$R_{i2}$  = age-specific death rate for the  $i$ th age group (ICD-10 file)

$w_i$  =  $i$ th age-specific U.S. Standard Population weight such that  $\sum w_i = 1.000000$

$D_{i2}$  = number of deaths for the  $i$ th age group (ICD-10 file) attributed to the cause of interest

$C_i$ 's are treated as constants in this report ( $C_i = C$ ). Assuming that we have both an age-specific rate and comparability ratio, we may proceed to compute the RSE for  $C_i R_{i1}$  for each age group. This is the first of two steps necessary for obtaining the RSE of an age-adjusted rate based on ICD-9 data that has been modified through a comparability ratio,  $R'_1$ . For an age-specific comparability ratio and death rate based on the ICD-9 revision, the RSE can be calculated as follows:

$$21. RSE(C_i \cdot R_{i1}) = 100 \sqrt{\left( \frac{RSE(R_{i1})}{100} \right)^2 + \left( \frac{RSE(C_i)}{100} \right)^2 \left[ 1 + \left( \frac{RSE(R_{i1})}{100} \right)^2 \right]}$$

where

$C_i$  = age-specific comparability ratio for the cause of interest

$R_{i1}$  = age-specific death rate for the  $i$ th age group (ICD-9 file)

Let  $R''_1 = \sum w_i C_i R_{i1}$ . The RSE for  $R''_1$  would incorporate all 11 values (corresponding to each age group) computed through the previous formula. For age-adjusted and comparability-modified death rates based on the ICD-9 revision, the RSE can be calculated as follows:

$$22. RSE(R''_1) = 100 \frac{\sqrt{\sum \left[ w_i^2 (C_i R_{i1})^2 \cdot \left( \frac{RSE(C_i R_{i1})}{100} \right)^2 \right]}}{R''_1}$$

where

$R''_1$  = age-adjusted death rate for a specific cause of interest based on ICD-9 data and modified by a comparability ratio

The following procedures for constructing approximate 95 percent confidence intervals are ordered depending on whether the age-adjusted death rate was computed based on the recently introduced ICD-10 revision or on the previous (ICD-9) revision, respectively. The rate based on the ICD-9 revision is adjusted by the application of a cause-specific comparability ratio.

For an age-adjusted death rate based on the ICD-10 revision, the 95 percent confidence interval may be captured as follows:

$$23. \text{ Lower limit: } R'_2 - \left( 1.96 \cdot R'_2 \cdot \frac{\text{RSE}(R'_2)}{100} \right)$$

$$24. \text{ Upper limit: } R'_2 + \left( 1.96 \cdot R'_2 \cdot \frac{\text{RSE}(R'_2)}{100} \right)$$

For an age-adjusted and comparability-modified death rate based on the ICD-9 revision, the 95 percent confidence interval may be captured as follows:

$$25. \text{ Lower limit: } R''_1 - \left( 1.96 \cdot R''_1 \cdot \frac{\text{RSE}(R''_1)}{100} \right)$$

$$26. \text{ Upper limit: } R''_1 + \left( 1.96 \cdot R''_1 \cdot \frac{\text{RSE}(R''_1)}{100} \right)$$

where

$R'_2$  = age-adjusted death rate (per 100,000) computed for data year under ICD-10

$R''_1$  = age-adjusted death rate (per 100,000) computed for data year under ICD-9



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