TECHNICAL APPENDIX FROM

VITAL STATISTICS OF UNITED STATES

1994

MORTALITY

U.S. DEPARTMENT OF
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CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL CENTER FOR HEALTH STATISTICS

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A copy of the technical appendix may be obtained by contacting the National Center for Health Statistics, Mortality Statistics Branch at 301-436-8884.

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Sources of data

Death and fetal-death statistics

Mortality statistics for 1994 are, as for all previous years except 1972, based on information from records of all deaths occurring in the United States. Fetal-death statistics for every year are based on all reports of fetal death received by the National Center for Health Statistics (NCHS).

The death-registration system and the fetal-death reporting system of the United States encompass the 50 States, the District of Columbia, New York City (which is independent of New York State for the purpose of death registration), Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Marianas. In statistical tabulations, United States refers only to the aggregate of the 50 States (including New York City) and the District of Columbia. Data for Guam, Puerto Rico, and the Virgin Islands are presented separately from data for the United States. No data are included for American Samoa or the Commonwealth of the Northern Marianas.

The Virgin Islands was admitted to the registration area for deaths in 1924; Puerto Rico, in 1932; and Guam, in 1970. Tabulations of death statistics for Puerto Rico and the Virgin Islands were regularly shown in *Vital Statistics of the United States* from the year of their admission through 1971 except for the years 1967-69, and tabulations for Guam were included for 1970 and 1971. Death statistics for Puerto Rico, the Virgin Islands, and Guam were not included in *Vital Statistics of the United States* for 1972 but have been included each year since 1973. Information for 1972 for these three areas was published in the respective annual vital statistics reports of the Department of Health of the Commonwealth of Puerto Rico, the Department of Health of the Virgin Islands, and the Department of Public Health and Social Services of the Government of Guam.

Procedures used by NCHS to collect death statistics have changed over the years. Before 1971 tabulations of deaths and fetal deaths were based solely on information obtained by NCHS from copies of the original certificates. The information from these copies was edited, coded, and tabulated. For 1960-70 all mortality information taken from these records was transferred by NCHS to magnetic tape for computer processing.

Beginning with 1971 an increasing number of States have provided NCHS, via the Vital Statistics Cooperative Program (VSCP), with electronic files of data coded according to NCHS specifications. The year in which State-coded demographic data were first transmitted in electronic data files to NCHS is shown below for each of the States, New York City, the District of Columbia, Puerto Rico, and the Virgin Islands, all of which now furnish demographic or nonmedical data in electronic data files.

1971	1972	1973
Florida	Maine	Colorado
	Missouri	Michigan
	New Hampshire	New York (except New York
	Rhode Island	City)
	Vermont	

1974
Illinois
Iowa
Kansas
Montana
Nebraska
Oregon
South Carolina

1975
Louisiana
Maryland
North Carolina
Oklahoma
Tennessee
Virginia
Wisconsin

1976
Alabama
Kentucky
Minnesota
Nevada
Texas
West Virginia

1977
Alaska
Idaho
Massachusetts
New York City
Ohio
Puerto Rico

1978
Indiana
Utah
Washington

1979
Connecticut
Hawaii
Mississippi
New Jersey
Pennsylvania
Wyoming

1980
Arkansas
New Mexico
South Dakota

1982
North Dakota

1985
Arizona
California
Delaware
Georgia
District of Columbia

1994
Virgin Islands

For Guam, mortality statistics for 1994 are based on information obtained directly by NCHS from copies of the original certificates received from the registration office.

In 1974 States began coding medical (cause-of-death) data in electronic data files according to NCHS specifications. The year in which State-coded medical data were first transmitted to NCHS is shown below for the 40 States now furnishing such data. In 1994 Maine, Montana, North Dakota, and Wyoming contracted with a private company to provide precoded medical data to NCHS. Kansas provided the medical data for Alaska. The remaining 10 VSCP States, New York City, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam submitted copies of the original certificates from which NCHS coded the medical data.

1974	1975	1980
Iowa	Louisiana	Colorado
Michigan	Nebraska	Kansas
	North Carolina	Massachusetts
	Virginia	Mississippi
	Wisconsin	New Hampshire
		Pennsylvania
		South Carolina

1981	1983	1984
Maine	Minnesota	Maryland
		New York (except New York City)
		Vermont

1986	1988	1989
California	Alaska	Georgia
Florida	Delaware	Indiana
Texas	Idaho	Washington
	North Dakota	
	Wyoming	

1991	1992	1993
Arkansas	Montana	Alabama
		Connecticut
		Hawaii
		Nevada
		Oregon
		South Dakota

1994
Oklahoma
Rhode Island

For 1994 and previous years except 1972, NCHS coded the medical information from copies of the original certificates received from the registration offices for all deaths occurring in those States that were not furnishing NCHS with medical data coded according to NCHS specifications. For 1981 and 1982, these procedures were modified because of a coding and processing backlog resulting from personnel and budgetary restrictions. To produce the mortality files on a timely basis with reduced resources, NCHS used State-coded underlying cause-of-death information supplied by 19 States for 50 percent of the records; for the other 50 percent of the records for these States as well as for 100 percent of the records for the remaining 21 registration areas, NCHS coded the medical information. Mortality statistics for 1972 were based on information obtained from a 50-percent sample of death records instead of from all records as in other years. The sample resulted from personnel and budgetary

restrictions. Sampling variation associated with the 50-percent sample is described in "Estimates of errors arising from 50-percent sample for 1972" under "Quality control procedures".

In 1994, 43 States, New York City, the District of Columbia, Puerto Rico, and the Virgin Islands provided NCHS, via the VSCP, electronic data files of fetal-death data coded according to NCHS specifications. The remaining seven States--Arizona, California, Louisiana, Nevada, Ohio, Pennsylvania, and Wyoming--and Guam submitted photocopies of original reports of fetal deaths. For the registration areas submitting photocopies, the demographic items were coded by NCHS.

Standard certificates and reports

For many years, the U.S. Standard Certificate of Death and the U.S. Standard Report of Fetal Death, issued by the Public Health Service, have been used as the principal means to attain uniformity in the contents of documents used to collect information on these events. They have been modified in each State to the extent required by the particular needs of the State or by special provisions of the State vital statistics law. However, the certificates or reports of most States conform closely in content and arrangement to the standards.

The first issue of the U.S. Standard Certificate of Death appeared in 1900. Since then, it has been revised periodically by the national vital statistics agency through consultation with State health officers and registrars; Federal agencies concerned with vital statistics; national, State, and county medical societies; and others working in such fields as public health, social welfare, demography, and insurance. This revision procedure has ensured careful evaluation of each item in terms of its current and future usefulness for legal, medical and health, demographic, and research purposes. New items have been added when necessary, and old items have been modified to ensure better reporting; or in some cases, items have been dropped when their usefulness appeared to be limited.

The current versions of the U.S. Standard Certificate of Death and the U.S. Standard Report of Fetal Death were recommended for State use beginning on January 1, 1989. The U.S. Standard Certificate of Death and the U.S. Standard Report of Fetal Death are shown in figures 7-A and 7-B, respectively (1).

History

The first death statistics published by the Federal Government concerned events in 1850 and were based on statistics collected during the decennial census of that year. In 1880 a national "registration area" was created for deaths. Originally, this area consisted of Massachusetts, New Jersey, the District of Columbia, and several large cities that had efficient systems for death registration. The death-registration area continued to expand until 1933, when it included for the first time the entire United States. Tables showing data for death-registration States include the District of Columbia for all years; registration cities in nonregistration States are not included. For more details on the history of the death-registration area, see *U.S. Vital Statistics System: Major Activities and Developments, 1950-95* (2). Statistics on fetal deaths were first published for the birth-registration area in 1918 and then every year beginning with 1922.

Classification of data

The principal value of vital statistics data is realized through the presentation of rates, which are computed by relating the vital events of a class to the population of a similarly defined class. Vital statistics and population statistics must therefore be classified according to similarly defined systems and tabulated in comparable groups. Even when the variables common to both, such as geographic area, age, sex, and race, have been similarly classified and tabulated, differences between the enumeration method of obtaining population data and the registration method of obtaining vital statistics data may result in significant discrepancies.

The general rules used in the classification of geographic and personal items for deaths and fetal deaths for 1994 are set forth in two NCHS instruction manuals (3,4). A discussion of the classification of certain important items is presented below.

Classification by occurrence and residence

Tabulations for the United States and specified geographic areas are classified by place of residence unless stated as by place of occurrence. Before 1970 resident mortality statistics for the United States included all deaths occurring in the States and the District of Columbia, with deaths of nonresidents assigned to place of death. For the United States (50 States and the District of Columbia), deaths of nonresidents refers to deaths that occur in the United States of nonresident aliens; nationals residing abroad; and residents of Puerto Rico, the Virgin Islands, Guam, and other territories of the United States. Similarly, for Puerto Rico and for the Virgin Islands, deaths of nonresidents refers to deaths that occurred to a resident of any place other than Puerto Rico and the Virgin Islands, respectively. For Guam, however, deaths of nonresidents refers to deaths that occurred to a resident of any place other than Guam or the United States. Beginning with 1970 deaths of nonresidents are not included in tables by place of residence.

Deaths by place of occurrence, on the other hand, include deaths of both residents and nonresidents of the United States. Consequently, for each year beginning with 1970, the total number of deaths in the United States by place of occurrence was somewhat greater than the total by place of residence. For 1994 this difference amounted to 3,295 deaths.

Before 1970 except for 1964 and 1965, deaths of nonresidents of the United States occurring in the United States were treated as deaths of residents of the exact place of occurrence, which in most instances was an urban area. In 1964 and 1965, deaths of nonresidents of the United States occurring in the United States were allocated as deaths of residents of the balance of the county in which they occurred.

Residence error--Results of a 1960 study showed that the classification of residence information on the death certificates corresponded closely to the residence classification of the census records for the decedents whose records were matched (5).

A comparison of the results of this study of deaths with those for a previous matched record study of births (6) showed that the quality of residence data had improved considerably between 1950 and 1960. Both studies found that events in urban areas were overstated by the NCHS classification in comparison with the U.S. Bureau of the Census classification. The magnitude of the difference was substantially less for deaths in 1960 than it was for births in 1950.

The improvement is attributed to an item added in 1956 to the U.S. Standard Certificates of Birth and of Death, asking whether residence was inside or outside city limits. This new item aided in properly allocating the residence of persons living near cities but outside the corporate limits. Although this may have improved the quality of data, accurate determination of place of residence appears to be a continuing problem.

Geographic classification

The rules followed in the classification of geographic areas for deaths and fetal deaths are contained in the two instruction manuals referred to previously (3,4). The geographic codes assigned by NCHS on birth, death, and fetal-death records are given in another instruction manual (7). Beginning with 1994 data, the geographic codes were modified to reflect results of the 1990 census. For 1982-93 codes are based on the results of the 1980 census and for 1970-81 on the 1970 census.

Metropolitan statistical areas--The Metropolitan statistical areas (MSA's) and Primary metropolitan statistical areas (PMSA's) are those established by the U.S. Office of Management and Budget as of April 1, 1990, and used by the U.S. Bureau of the Census (8), except in the New England States.

Outside the New England States, an MSA has either a city with a population of at least 50,000 or a U.S. Bureau of the Census urbanized area of at least 50,000 and a total MSA population of at least 100,000. A PMSA consists of a large urbanized county or cluster of counties that demonstrate very strong internal economic and social links and has a population over one million. When PMSA's are defined, the larger area of which they are component parts is designated a Consolidated Metropolitan Statistical Area (CMSA) (9).

In the New England States, the U.S. Office of Management and Budget uses towns and cities rather than counties as geographic components of MSA's and PMSA's. However, NCHS cannot use this classification for these States because its data are not coded to identify all towns. Instead, NCHS uses New England County Metropolitan Areas (NECMA's). Made up of county units, these areas are established by the U.S. Office of Management and Budget (10).

Metropolitan and nonmetropolitan counties--Independent cities and counties included in MSA's and PMSA's or in NECMA's are included in data for metropolitan counties; all other counties are classified as nonmetropolitan.

Population-size groups--In 1994 vital statistics data for cities and certain other urban places were classified according to the population enumerated in the 1990 Census of Population. Data are available for individual cities and other urban places of 10,000 or more population. As a result of changes in the enumerated population between 1980 and 1990, some urban places are no longer identified separately and other urban places have been added. Data for the remaining areas not separately identified appear under the heading “balance of area” or “balance of county.” For the years 1982-93 classification of areas was determined by the population enumerated in the 1980 Census of Population and for the years 1970-81 in the 1970 Census of Population.

Urban places other than incorporated cities include the following:

- Each town in New England, New York, and Wisconsin and each township in Michigan, New Jersey, and Pennsylvania that had no incorporated municipality as a subdivision and had either 25,000 inhabitants or more, or a population of 10,000 to 25,000 and a density of 1,000 persons or more per square mile.
- Each county in States other than those indicated above that had no incorporated municipality within its boundary and had a density of 1,000 persons or more per square mile. (Arlington County, Virginia, is the only county classified as urban under this rule.)
- Each place in Hawaii with a population of 10,000 or more. (There are no incorporated cities in the State.)

Before 1964 places were classified as “urban” or “rural.” Technical appendixes for earlier years discuss the previous classification system.

State or country of birth

Mortality statistics by State or country of birth became available beginning with 1979. State or country of birth of a decedent is assigned to 1 of the 50 States or the District of Columbia; or to Puerto Rico, the Virgin Islands, or Guam--if specified on the death certificate. The place of birth is also tabulated for Canada, Cuba, Mexico, and for the remainder of the world. Deaths for which information on State or country of birth was unknown, not stated, or not classifiable accounted for a small proportion of all deaths in 1994, about 0.6 percent.

Early mortality reports published by the U.S. Bureau of the Census contained tables showing nativity of parents as well as nativity of decedent. Publication of these tables was discontinued in 1933. Mortality data showing nativity of decedent were again published in annual reports for 1939-41 and for 1950.

Age

The age recorded on the death record is the age at last birthday, the same as the age classification used by the U.S. Bureau of the Census. For 1994 data, 414 resident death records (0.02 percent) contained not-stated age. For computation of age-specific and age-adjusted death rates, deaths with age not stated are excluded. For life table computation, deaths with age not stated are distributed proportionately.

Race

For vital statistics in the United States in 1994, deaths are classified by race--white, black, American Indian, Chinese, Hawaiian, Japanese, Filipino, and Other Asian or Pacific Islander. Beginning with 1992 data, an expanded code structure was used for seven States showing five additional Asian or Pacific Islander groups. These groups are Asian Indian, Korean, Samoan, Vietnamese, and Guamanian. These groups are coded only for deaths occurring in California, Hawaii, Illinois, New Jersey, New York, Texas, and Washington. In 1990, at least two-thirds of the U.S. population of each of these groups lived in this seven-State reporting area: Asian Indian, Korean, and Vietnamese, 63-66 percent; Guamanian, 74 percent; and Samoan, 84 percent (11). This additional race detail is available on the mortality public-use data tapes (12,13) and in tabular form. Beginning with 1992 data, all records coded as “other races” (0.01 percent of the total deaths in 1994) were assigned to the specified race of the previous record rather than to a separate category called “other races.” Mortality data for Filipino and Other Asian or Pacific Islander were shown for the first time in 1979.

The white category includes, in addition to persons reported as white, those reported in the race item on the death certificate as Hispanic, Mexican, Puerto Rican, Cuban, and all other Caucasians. The American Indian category includes North, Central, and South American Indian, Eskimo, and Aleut. If the racial entry on the death certificate indicates a mixture of Hawaiian and any other race, the entry is coded to Hawaiian. If the race is given as a mixture of white and any other race, the entry is coded to the appropriate nonwhite race. If a mixture of races other than white is given (except Hawaiian), the entry is coded to the first race listed. This procedure for coding the first race listed has been used since 1969. Before 1969 if the entry for race was a mixture of black and any other race except Hawaiian, the entry was coded to black.

Race not stated--For 1994 the number of death records for which race was unknown, not stated, or not classifiable was 2,319 or 0.1 percent of the total deaths. Beginning in 1992 death records with race not stated were assigned to the specified race of the previous record with known race. From 1965 to 1991 death records with race entry not stated were assigned to a racial designation as follows: If the preceding record was coded white, the code assignment was made to white; if the code was other than white, the assignment was made to black. Before 1964 all records with race not stated were assigned to white except records of residents of New Jersey for 1962-64.

New Jersey, 1962-64--New Jersey omitted the race item from its certificates of live birth, death, and fetal death in the beginning of 1962. The item was restored during the latter part of 1962. However, the certificate revision without the race item was used for most of 1962 as well as 1963. Therefore, figures by race for 1962 and 1963 exclude New Jersey. For 1964, 6.8 percent of the death records used for residents of New Jersey did not contain the race item.

Adjustments made in vital statistics to account for the omission of the race item in New Jersey for part of the certificates filed during 1962-64 are described in the Technical Appendix of *Vital Statistics of the United States* for each of those data years.

Quality of race data--A number of studies have been conducted on the reliability of race reported on the death certificate. These studies compare race reported on the death certificate with that reported on another data collection instrument such as the census or a survey. Race information on the death certificate is reported by the funeral director as provided by an informant, often the surviving next of kin, or, in the absence of an informant, on the basis of observation. In contrast, race on the census or the Current Population Survey (CPS) is self-reported and, therefore, may be considered more valid. A high level of agreement between the death certificate and the census or survey report is essential to ensure unbiased death rates by race.

In one study a sample of approximately 340,000 death certificates was compared with census records for a 4-month period in 1960 (14). Percent agreement was 99.8 percent for white decedents, and 98.2 percent for black decedents; but less for the smaller minority groups (table A). In another study 29,713 death certificates were compared with responses to the race questions from a total of 12 CPS's conducted by the U.S. Bureau of the Census for the years 1979-85 (15). In this study, entitled the National Longitudinal Mortality Study, agreement for white decedents was 99.2 and for black decedents, 98.2; agreement was less for the smaller race groups. In 1986 the National Mortality Followback Survey, conducted by NCHS, listed a question about the race of decedents 25 years old and over. The total sample was 18,733 decedents (16). The rates of agreement were similar to those observed in the other studies.

All of these studies show that persons self-reported as American Indian or Asian on census and survey records (and by informants in the Followback Survey) were sometimes reported as white on the death certificate. The net effect of misclassification is an underestimation of deaths and death rates for the smaller minority races.

Hispanic origin

Mortality statistics for the Hispanic-origin population are based on information for those States and the District of Columbia that included items on the death certificate to identify Hispanic or ethnic origin of decedents. Data for 1994 were obtained from the District of Columbia and all States except Oklahoma, which was excluded because its death certificate did not include an item to identify Hispanic or ethnic origin.

Hispanic mortality data were published for the first time in 1984. Generally, the reporting States used items similar to one of two basic formats recommended by NCHS. The first format is directed specifically toward the Hispanic population and appears on the U.S. Standard Certificate of Death as follows:

- Was decedent of Hispanic origin?
  (Specify No or Yes--If Yes, specify Cuban, Mexican, Puerto Rican, etc.)
  ____ No ____ Yes
  Specify:

The second format is a more general ancestry item and appears as follows:

- Ancestry--Mexican, Puerto Rican, Cuban, African, English, Irish, German, Hmong, etc., (specify)

Death rates --Death rates for the total Hispanic population, selected Hispanic subgroups, and race for non-Hispanic origin utilize demographically-derived population estimates produced by the Bureau of the Census (17, 18). By comparison, population estimates for Mexicans, Puerto Ricans, Cubans, and Other Hispanics are based in part on the Current Population Survey. Rates using the latter, therefore, are subject to sampling variation as well as random variation (see "Random variation and sampling errors").

The 49 States and the District of Columbia accounted for about 99.6 percent of the Hispanic population in the United States in 1990. This included about 99.5 percent of the Mexican population, 99.8 percent of the Puerto Rican population, 99.9 percent of the Cuban population, and 99.7 percent of the "Other Hispanic" population (11). For qualifications regarding infant mortality of the Hispanic-origin population, see "Infant deaths."

In 1994 New York City instituted the use of a revised death certificate where the race and ethnic items were to be completed by the funeral director. Previously these items were completed by the physician or medical examiner. In 1994, of the 71022 deaths occurring in New York City, only 4 percent were coded to Unknown origin whereas 23 percent were coded to Unknown origin in 1993. Between 1993 and 1994 the number of deaths occurring in New York City decreased 69 percent for Other and unknown Hispanic and 83 percent for Unknown origin. As a result of increased specificity in reporting ethnic origin, the number of deaths increased substantially in 1994 for Non-Hispanic and for each of the specified Hispanic subgroups.

Quality of data on Hispanic origin--A study (15) examined the reliability of Hispanic origin reported on 43,520 death certificates with that reported on a total of 12 CPS's conducted by the U.S. Bureau of the Census for the years 1979-85. In this study, agreement was 89.7 percent for any report of Hispanic origin. The ratio of deaths for CPS divided by deaths for death certificate was 1.07 percent indicating net underreporting of Hispanic origin on death certificates as compared with self-reports on the surveys. The sample was too small to assess the reliability of specified Hispanic groups.

Marital status

Mortality statistics by marital status have been published annually since 1979. They were previously published in the annual volumes for 1949-51 and 1959-61. Several reports analyzing mortality by marital status have been published, including the special study based on 1959-61 data (19). Reference to earlier reports is given in the appendix of part B of the 1959-61 special study.

Mortality statistics by marital status are tabulated separately for never married, married, widowed, and divorced. Certificates on which the marriage is specified as being annulled are classified as never married. Where marital status is specified as separated or common-law marriage, it is classified as married. Of the 2,231,606 resident deaths 15 years of age and over in 1994, 9,555 certificates (0.4 percent) had marital status not stated.

Death rates -- Death rates for marital status use population estimates produced by the Bureau of the Census based on the Current Population Survey (18). Because these population estimates are subject to sampling variation, death rates based on them are subject to both sampling variation as well as random variation (see "Random variation and sampling errors").

Educational attainment

Beginning with the 1989 data year, mortality data on educational attainment have been tabulated from information reported on the death certificate. As a result of the revisions of the U.S. Standard Certificate of Death (1), this item was added to the certificates of a large number of States:

- Decedent's Education (Specify only highest grade completed)
  Elementary/Secondary (0-12)
  College (1-4 or 5+)

Mortality data on educational attainment for 1994 were reported by 46 States and the District of Columbia. Georgia, Oklahoma, Rhode Island, and South Dakota did not include an educational attainment item on their death certificate.

Selected mortality tables on educational attainment are based on deaths to residents of 45 States and the District of Columbia whose data were approximately 80 percent or more complete on a place-of- occurrence basis. In addition to the four States mentioned previously, data for Kentucky are excluded from these tables because more than 20 percent of their death certificates were classified to "unknown educational attainment." Data for New York City are excluded because the education item on its death certificate provided only grouped educational attainment data, and did not provide the level of detail of educational attainment in single years of age needed by NCHS.

Place of death and status of decedent

Mortality statistics by type of place of death have been shown annually in *Vital Statistics of the United States* since 1979. Before that year they were published in 1958 (tables 1-30--1-32). In addition, mortality data also were available for the first time in 1979 for the status of decedent when death occurred in a hospital or medical center. The 1994 data were obtained from the following two items appearing on the revised U.S. Standard Certificate of Death (1):

- Item 9a. Place of Death (check only one)
  Hospital: Inpatient
  ER/Outpatient
  DOA
  Other: Nursing Home
  Residence
  Other (specify)

- Item 9b. Facility Name (If not institution, give street and number)

Before the 1989 revision of the Standard Certificate of Death, information on place of death and status of decedent could be determined if hospital or institution indicated Inpatient, Outpatient, ER, or DOA, and if the

name of the hospital or institution, which was used to determine the kind of facility, appeared on the certificate. The change to a checkbox format in many States for this item may affect the comparability of data for 1989 and subsequent years with data for years before 1989.

Except for Oklahoma, all of the States (including New York City) and the District of Columbia have item 9 (or its equivalent) on their certificates. For all reporting States and the District of Columbia in the VSCP, NCHS accepts the State definition, classification, or code for hospitals, medical centers, nursing homes, or other institutions.

Effective with data for 1980, the coding of place of death and status of decedent was modified. A new coding category was added: "Dead on arrival--hospital, clinic, or medical center." Had the 1979 coding categories been used, these deaths would have been coded to "Place unknown."

California--For the first 5 months of data year 1989, California coded "residence" to "other" for "Place of death."

Mortality by month and date of death

Deaths by month have been tabulated regularly and are available for each year since 1900. Deaths from selected causes by date of death have been published each year since 1972 and are available for 1962.

Numbers of deaths by date of death are produced for the total number of deaths and for the numbers of deaths for the following three causes, for which the greatest interest in date of occurrence of death has been expressed: Motor vehicle accidents, Suicide, and Homicide and legal intervention.

These data show the frequency distribution of deaths for the selected causes by day of week. They also make it possible to identify holidays with peak numbers of deaths from specified causes.

Report of autopsy

Before 1972 the last year for which autopsy data were tabulated was 1958. Beginning in 1972 all registration areas requested information on the death certificate as to whether an autopsy was performed. For 1994 autopsies were reported on 213,879 death certificates, 9.4 percent of the total.

Cause of death

Cause-of-death classification--Since 1949 cause-of-death statistics have been based on the underlying cause of death, which is defined as "(a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury" (20).

For each death the underlying cause is selected from an array of conditions reported in the medical certification section on the death certificate. This section provides a format for entering the cause of death sequentially. The conditions are translated into medical codes through use of the classification structure and the selection and modification rules contained in the applicable revision of the *International Classification of Diseases* (ICD), published by the World Health Organization (WHO). Selection rules provide guidance for systematically identifying the underlying cause of death. Modification rules are intended to improve the usefulness of mortality statistics by giving preference to certain classification categories over others and/or to consolidate two conditions or more on the certificate into one classification category.

As a statistical datum, underlying cause of death is a simple, one-dimensional statistic; it is conceptually easy to understand and a well-accepted measure of mortality. It identifies the initiating cause of death and is therefore most useful to public health officials in developing measures to prevent the onset of the chain of events leading to death. The rules for selecting the underlying cause of death are included in ICD as a means of

standardizing classification, which contributes toward comparability and uniformity in mortality medical statistics among countries.

Tabulation lists--Beginning with data year 1979, the cause-of-death statistics published by NCHS have been classified according to the Ninth Revision of the *International Classification of Diseases* (ICD-9) (20). In addition to specifying that ICD-9 be used, WHO also recommends how the data should be tabulated to promote international comparability. The recommended system for tabulating data in ICD-9 allows countries to construct their mortality and morbidity tabulation lists from the rubrics of the WHO Basic Tabulation List (BTL) if the rubrics from the WHO mortality and morbidity lists, respectively, are included. This tabulation system for the Ninth Revision is more flexible than that of the Eighth Revision, in which specific lists were recommended for tabulating mortality and morbidity data.

The BTL recommended under the Ninth Revision consists of 57 two-digit rubrics that when added equal the "all causes" total. Identified within each two-digit rubric are up to nine three-digit rubrics that are numbered from zero to eight and whose total does not equal the two-digit rubric. The two-digit BTL rubrics 01-46 are used for the tabulation of nonviolent deaths according to ICD categories 001-799. Rubrics relating to chapter 17 (nature-of-injury causes 47-56) are not used by NCHS for selecting underlying cause of death; rather, preference is given to rubrics E47-E56. The 57th two-digit rubric (VO) is the Supplementary Classification of Factors Influencing Health Status and Contact with Health Services and is not appropriate for the tabulation of mortality data. The WHO Mortality List, a subset of the titles contained in the BTL, consists of 50 rubrics that are the minimum necessary for the national display of mortality data.

Five lists of causes have been developed for tabulation and publication of mortality data--the Each-Cause List, List of 282 Selected Causes of Death, List of 72 Selected Causes of Death, List of 61 Selected Causes of Infant Death, and List of 34 Selected Causes of Death. These lists were designed to be as comparable as possible with the NCHS lists used under the Eighth Revision. However, complete comparability could not always be achieved.

The Each-Cause List is made up of each three-digit category of the WHO Detailed List to which deaths may be validly assigned and most four-digit subcategories. This list is used for the tabulation of data for the entire United States. The Each-Cause table in *Vital Statistics of the United States* does not show the four-digit or special five-digit subcategories provided for Motor vehicle accidents (E810-E825). The four-digit subcategories that identify persons injured and the five-digit subcategories that identify place of accident for deaths from nontransport accidents are tabulated separately.

The List of 282 Selected Causes of Death is constructed from BTL rubrics 01-46 and E47-E56. Each of the 56 BTL two-digit titles can be obtained either directly or by combining titles in the List. The three-digit level of the BTL is modified more extensively. Where more detail was desired, categories not shown in the three-digit rubrics were added to the List of 282 Selected Causes of Death. Where less detail was needed, the three-digit rubrics were combined. Moreover, each of the 50 rubrics of the WHO Mortality List can be obtained from the List of 282 Selected Causes of Death. This list is used for tabulating both State and national mortality data.

The List of 72 Selected Causes of Death was, in part, constructed by combining titles in the List of 282 Selected Causes of Death. It is used in tabulating data for the entire United States and each State and for Metropolitan statistical areas and for ranking leading causes of death excluding infants. (See "Cause-of-death ranking".)

The List of 61 Selected Causes of Infant Death shows more detailed titles for Congenital anomalies and Certain conditions originating in the perinatal period than any other list except the Each-Cause List, and is used for ranking infant causes of death. (See "Cause-of-death ranking".)

The List of 34 Selected Causes of Death was created by combining titles in the List of 72 Selected Causes. This list is used for tabulating data by detailed geographic area.

Beginning with data for 1987, changes were made in these lists to accommodate the introduction in the United States of new categories *042-*044 for Human immunodeficiency virus (HIV) infection. The changes are described in the Technical Appendix from *Vital Statistics of the United States*, 1987. To facilitate data use,

beginning with data for 1994, the categories for HIV infection (*042-*044) and Alzheimer's disease (ICD-9 No. 331.0) are included separately at the bottom of tables showing the List of 72 Selected Causes of Death and the List of 282 Selected Causes of Death. They are also inclusions in the body of each table.

Effect of list revisions--The International Lists, or adaptations of them, used in the United States since 1900, have been revised approximately every 10 years so the disease classifications may be consistent with advances in medical science and with changes in diagnostic practice. Each revision of the International Lists has produced some break in comparability of cause-of-death statistics. Cause-of-death statistics beginning with 1979 are classified by NCHS according to ICD-9 (20). For a discussion of each of the classifications used with death statistics since 1900, see *Vital Statistics of the United States*, 1979, Volume II, Mortality, Part A, section 7, pages 9-14.

A dual coding study was undertaken in which the Ninth and the Eighth Revisions were compared to measure the extent of discontinuity in cause-of-death statistics resulting from introducing the new revision. A study for the List of 72 Selected Causes of Death and the List of 10 Selected Causes of Infant Death has been published (21). The List of 10 Selected Causes of Infant Death is a basic NCHS tabulation list used for provisional data in the *Monthly Vital Statistics Report*, another NCHS publication. Comparability studies were also undertaken between the Eighth and Seventh, Seventh and Sixth, and Sixth and Fifth Revisions. For additional information about these studies, see the Technical Appendix from *Vital Statistics of the United States*, 1979.

Significant coding changes under the Ninth Revision--Since the implementation of ICD-9 in the United States, effective with mortality data for 1979, several coding changes have been introduced. The more important changes are discussed as follows: In early 1983 a change that affected data from 1981 to 1986 was made in the coding of Acquired immunodeficiency syndrome and HIV infection. Also effective with data year 1981 was a coding change for Poliomyelitis. For data year 1982, the definition of child was changed (which affects the classification of deaths to a number of categories, including Child battering and other maltreatment), and guidelines for coding deaths to the category Child battering and other maltreatment (ICD-9 No. E967) were changed also. During the calendar year 1985, detailed instructions for coding Motor vehicle accidents involving all-terrain vehicles were implemented to ensure consistency in coding these accidents. Effective with data year 1986, "Primary" and "Invasive" tumors, unspecified, were classified as "Malignant"; these neoplasms had been classified to Neoplasms of unspecified nature (ICD-9 No. 239).

Beginning with data for 1987, NCHS introduced new category numbers *042-*044 for classifying and coding HIV infection, formerly referred to as Human T-cell lymphotropic virus-III/lymphadenopathy associated virus (HTLV-III/LAV) infection. The asterisks appearing before the categories indicate these codes are not part of ICD-9. Also changed effective with data year 1987 were coding rules for the conditions "Dehydration" and "Disseminated intravascular coagulopathy." Effective with data year 1988, minor content changes were made to the classification for HIV infection. Detailed discussion of these changes may be found in the Technical Appendix from *Vital Statistics of the United States*, 1988.

Coding in 1994--The rules and instructions used in coding 1994 mortality medical data remained essentially the same as those used for the 1993 data.

Medical certification--The use of a standard classification list, although essential for State, regional, and international comparison, does not ensure strict comparability of the tabulated figures. A high degree of comparability among areas could be attained only if all records of cause of death were reported with equal accuracy and completeness. The medical certification of cause of death can be made only by a qualified person, usually a physician, a medical examiner, or a coroner. Therefore, the reliability and accuracy of cause-of-death statistics are, to a large extent, governed by the ability of the certifier to make the proper diagnosis and by the care with which he or she records this information on the death certificate.

A number of studies have been undertaken on the quality of medical certification on the death certificate. In general, these have been for relatively small samples and for limited geographic areas. A bibliography prepared by NCHS (22), covering 128 references over 23 years, indicates no definitive conclusions have been reached about

the quality of medical certification on the death certificate. No country has a well-defined program for systematically assessing the quality of medical certifications reported on death certificates or for measuring the error effects on the levels and trends of cause-of-death statistics.

One index of the quality of reporting causes of death is the proportion of death certificates coded to the Ninth Revision, Chapter XVI, Symptoms, signs, and ill-defined conditions (ICD-9 Nos. 780-799). Although deaths occur for which it is impossible to determine the underlying cause, this proportion indicates the care and consideration given to the certification by the medical certifier. This proportion also may be used as a rough measure of the specificity of the medical diagnoses made by the certifier in various areas. In 1994, 1.1 percent of all reported deaths in the United States were assigned to this category. The percent of deaths assigned to this category remained stable at 1.5 percent from 1981 to 1987, but has declined slightly since then.

Automated selection of underlying cause of death--Before data for 1968, mortality medical data were based on manual coding of an underlying cause of death for each certificate in accordance with WHO rules. Effective with data year 1968, NCHS converted to computerized coding of the underlying cause and manual coding of all causes (multiple causes) on the death certificate. In this system, called Automated Classification of Medical Entities (ACME) (23), the multiple cause codes serve as inputs to the computer software that employs WHO rules to select the underlying cause. Many States also have implemented ACME and provide multiple cause and underlying cause data to NCHS in electronic form.

The ACME system applies the same rules for selecting the underlying cause as would be applied manually by a nosologist; however, under this system, the computer consistently applies the same criteria, thus eliminating intercoder variation in this step of the process.

The ACME computer program requires the coding of all conditions shown on the medical certification. These codes are matched automatically against decision tables that consistently select the underlying cause of death for each record according to the international rules. The decision tables provide the comprehensive relationships among the conditions classified by ICD when applying the rules of selection and modification.

The decision tables were developed by NCHS staff on the basis of their experience in coding underlying causes of death under the earlier manual coding system and as a result of periodic independent validations. These tables periodically are updated to reflect additional new information on the relationship among medical conditions. For data year 1988, these tables were amended to incorporate minor changes to the previously mentioned classification for HIV infection (*042-*044) that originally had been implemented with data year 1987. Coding procedures for selecting the underlying cause of death by using the ACME computer program, as well as by using the ACME decision tables, are documented in NCHS instruction manuals (23,24,25).

Beginning with data year 1990, another computer system was implemented for automating cause-of-death coding. This system, called Mortality Medical Indexing, Classification, and Retrieval (MICAR) (26,27), automates coding multiple causes of death. Because MICAR automates multiple-cause coding rules, errors in recognizing terms, applying coding rules, and using the ICD index are eliminated. The use of the MICAR system ensures consistent application of multiple-cause coding rules, which is especially important for rules that are complex and infrequently applied. In addition, MICAR ultimately will provide more detailed information on the conditions reported on death certificates than is available through the ICD category structure (28). In the first year of implementation, only about 5 percent (94,372) of the Nation's death records were coded using MICAR with subsequent processing through ACME. This percentage increased from 26 percent in 1991 to 35 percent in 1992, 59 percent in 1993, and 72 percent in 1994. States whose data were coded by MICAR in 1994 included Alabama, Arizona, Arkansas, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York (excluding New York City), New York City, North Carolina, Ohio, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, West Virginia, and Wisconsin. For these States, MICAR processed about 88 percent of the mortality records with an average system error rate of 0.33 on an underlying

cause basis, and a rate of 0.58 on a multiple-cause basis. Records that MICAR was unable to process were coded manually and then processed using ACME.

Beginning with data year 1993, another computer system was implemented for automating cause-of-death coding. This system, called SuperMICAR, is an enhancement of the MICAR system, which allows for total literal entry of the multiple cause-of-death text as reported by the certifier. This information is automatically coded by the MICAR and ACME computer systems. In the first year of implementation, about 9 percent of the Nation's death records were coded using SuperMICAR with subsequent processing through MICAR and ACME. This percentage increased from 9 percent in 1993 to 12 percent in 1994. States using SuperMICAR in 1994 included Colorado, Connecticut, Hawaii, Idaho, Michigan, Minnesota, Oklahoma, Oregon, Rhode Island, and South Carolina. In 1994, for these States, SuperMICAR processed about 75 percent of the mortality records with an average system error rate of 0.50 on an underlying cause basis, and a rate of 1.03 on a multiple-cause basis. Records that SuperMICAR was unable to process were coded manually and then processed using ACME.

Cause-of-death ranking--Cause-of-death ranking except for infants is based on numbers of deaths assigned to categories in the List of 72 Selected Causes of Death, Human immunodeficiency virus infection (*042-*044), and Alzheimer's disease (ICD-9 No. 331.0). Added to the list of rankable causes was HIV infection, effective with data year 1987 and Alzheimer's disease, effective with data year 1994. Cause-of-death ranking for infants is based on the List of 61 Selected Causes of Infant Death and HIV infection (added to the list of rankable causes of infant death effective with data year 1987).

The group titles Major cardiovascular diseases and Symptoms, signs, and ill-defined conditions from the List of 72 Selected Causes of Death are not ranked; Certain conditions originating in the perinatal period and Symptoms, signs, and ill-defined conditions from the List of 61 Selected Causes of Infant Death are not ranked. In addition, category titles beginning with the words "Other" or "All other" are not ranked to determine the leading causes of death. When one of the titles representing a subtotal is ranked (such as Tuberculosis), its component parts (in this case, Tuberculosis of respiratory system and Other tuberculosis) are not ranked.

Maternal deaths

Maternal deaths are those for which the certifying physician has designated a maternal condition as the underlying cause of death. Maternal conditions are those assigned to Complications of pregnancy, childbirth, and the puerperium (ICD-9 Nos. 630-676). In the Ninth Revision, WHO for the first time defined a maternal death as follows:

> A maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Under the Eighth Revision, maternal deaths were assigned to the category "Complications of pregnancy, childbirth, and the puerperium" (*Eighth Revision International Classification of Diseases, Adapted for Use in the United States* (ICDA-8) Nos. 630-678). Although WHO did not define maternal mortality, an NCHS classification rule existed that limited the definition of a maternal death to a death that occurred within a year after termination of pregnancy from any "maternal cause," that is, any cause within the range of ICDA-8 Nos. 630-678. This rule applied only if a duration was given for the condition. If no duration was specified and the underlying cause of death was a maternal condition, the duration was assumed to be within a year and the death was coded by NCHS as a maternal death. The change from an under-1-year limitation for duration used in the Eighth Revision to an under-42-days limitation used in the Ninth Revision did not have much effect on the comparability of maternal mortality statistics. However, comparability was affected by the following classification change: Under the Ninth

Revision, maternal causes of death have been expanded to include Indirect obstetric causes (ICD-9 Nos. 647-648). These causes include Infective and parasitic conditions as well as other conditions present in the mother and classifiable elsewhere but that complicate pregnancy, childbirth, and the puerperium, such as Syphilis, Tuberculosis, Diabetes mellitus, Drug dependence, and Congenital cardiovascular disorders.

Maternal mortality rates are computed on the basis of the number of live births. The maternal mortality rate indicates the likelihood of a pregnant woman dying of maternal causes. The number of live births used in the denominator is an approximation of the population of pregnant women who are at risk of a maternal death.

Race--Beginning with the 1989 data year, NCHS changed the method of tabulating live birth and fetal death data by race from race of parents to race of mother. This resulted in a discontinuity in maternal mortality rates by race between 1989-94 and previous years; see "Change in tabulation of race data for live births and fetal deaths," under "Infant deaths" in the Technical Appendix from *Vital Statistics of the United States*, 1990, or the series report, "Effect on Mortality Rates of the 1989 Change in Tabulating Race" (29).

Infant deaths

Age--Infant death is defined as a death under 1 year of age. The term excludes fetal deaths. Infant deaths usually are divided into two categories according to age, neonatal and postneonatal. Neonatal deaths are those that occur during the first 27 days of life; postneonatal deaths are those that occur between 28 days and 1 year of age. Generally, it has been believed that different factors influencing the child's survival predominate in these two periods: Factors associated with prenatal development, heredity, and the birth process were considered dominant in the neonatal period; environmental factors, such as nutrition, hygiene, and accidents, were considered more important in the postneonatal period. Recently, however, the distinction between these two periods has blurred due in part to advances in neonatology, which have enabled more very small premature infants to survive the neonatal period.

Rates--Infant mortality rates are the most commonly-used indices for measuring the risk of dying during the first year of life; they are calculated by dividing the number of infant deaths in a calendar year by the number of live births registered for the same period and are presented as rates per 1,000 or per 100,000 live births. Infant mortality rates use the number of live births in the denominator to approximate the population at risk of dying before the first birthday. This measure is an approximation because some live births will not have been exposed to a full year's risk of dying and some of the infants who die during a year will have been born in the previous year. The error introduced in the infant mortality rate by this inexactness is usually small, especially when the birth rate is relatively constant from year to year (30,31). Other sources of error in the infant mortality rate have been attributed to differences in applying the definitions for infant death and fetal death when registering the event (32,33,34).

In contrast to infant mortality rates based on live births, infant death rates are based on the estimated population under 1 year of age. Infant death rates, which appear in tabulations of age-specific death rates, are calculated by dividing the number of infant deaths in a calendar year by the estimated midyear population of persons under 1 year of age and are presented as rates per 100,000 population in this age group. Patterns and trends in the infant death rate may differ somewhat from those of the more commonly used "infant mortality rate," mainly because of differences in the nature of the denominator and in the time reference. Whereas the population denominator for the infant death rate is estimated using data on births, infant deaths, and migration for the 12-month period of July-June, the denominator for the infant mortality rate is a count of births occurring during the 12 months of January-December. The difference in the time reference can result in different trends between the two indices during periods when birth rates are moving up or down markedly.

The infant death rate also is subject to greater imprecision than is the infant mortality rate because of problems of enumerating and estimating the population under 1 year of age (33).

Change in tabulation of race data for live births and fetal deaths--Beginning with the 1989 data year, NCHS changed the method of tabulating live-birth and fetal-death data by race from race of parents to race of mother. As in previous years, race for infant and maternal deaths (the numerator of the rate) is tabulated by the race of the decedent. Because live births comprise the denominator of infant and maternal mortality rates, this change resulted in a discontinuity in rates between 1989-94 data, and that for previous years. For fetal and perinatal mortality rates, the numerator and the denominator of the rates are affected, resulting in a slightly smaller discontinuity. For additional information, see the Technical Appendix from *Vital Statistics of the United States*, 1990, or the series report, "Effect on Mortality Rates of the 1989 Change in Tabulating Race" (29).

Comparison of race data from birth and death certificates--Regardless of whether vital events are tabulated by race of mother or by race of parents, studies in which race on the birth and death certificates for the same infant were compared find inconsistencies in reporting race between birth and death certificates (35).

These reporting inconsistencies can result in systematic biases in infant mortality rates by specified race, in particular, underestimates for specified races other than white or black. In the computation of race-specific infant mortality rates, the race item for the numerator comes from the death certificate, and for the denominator, from the birth certificate. Biases in the rates may arise because of possible inconsistencies in reporting race on these two vital records. Race of the mother and father is reported on the birth certificate by the mother at the time of delivery; whereas race of the deceased infant is reported on the death certificate by the funeral director based on observation or on information supplied by an informant, such as a parent. Previous studies have noted the race for an infant who died and was of a smaller minority race group is sometimes reported as white on the death certificate but is reported as the minority race group on the birth certificate, resulting, in the aggregate, in understatement of infant mortality for smaller race groups (35).

Estimates can be made of the degree of bias in race-specific infant mortality rates by comparing rates for birth cohorts based on the linked birth and infant death data set (36,37) with period rates based on mortality data for the same year(s). The period rates are unlinked because the infant death certificates have not been linked to the corresponding birth certificates.

The comparison of linked and unlinked rates is somewhat affected by small differences in the events included in the numerators of the two rates. The numerator of the linked rate is comprised of infant deaths to the cohort of infants born in a calendar year whereas the numerator of the unlinked rate is comprised of infant deaths occurring in the calendar year.

Based on data comparing infant mortality rates from the linked data set for the birth cohorts of 1989-91 with unlinked rates for the period 1989-91, bias in the rates for the two major race groups--white and black--is small (table B). However, linked rates for the smaller race groups are estimated to be higher than unlinked rates by 2 to 56 percent.

The exception to this pattern is for Hawaiians, where linked rates are 17 percent lower than unlinked rates. This may reflect the slightly different race coding rules used for Hawaiians than those used for other races (see "Race" under "Classification of data"). For mortality data, in cases of mixed Hawaiian and other race parentage, race is always classified as "Hawaiian." In contrast, the race data from the birth certificate is classified according to the race of the mother. The race data from the birth certificate is used in the denominator of the unlinked infant mortality rates, and in the numerator and denominator of the linked infant mortality rates. This difference leads to slightly fewer infant deaths being classified as Hawaiian in the linked data, compared to the unlinked data. The linked infant mortality rate for Hawaiians is considered to be more accurate, because the numerator and denominator data come from the same data source and are coded in the same manner.

Cohort infant mortality rates from the linked file have not been adjusted to reflect the 2 to 3 percent of infant death records that were not linked to their corresponding birth records. Because of systematic underestimation of infant mortality rates based on unlinked data, the national linked files should be used to measure infant mortality for races other than black and white. For the white and black populations, unlinked data are a close approximation of the rates based on linked files.

Hispanic origin--Infant mortality rates for the Hispanic-origin population are based on numbers of resident infant deaths reported to be of Hispanic origin (see "Hispanic origin") and numbers of resident live births by Hispanic origin of mother for the 49 States and the District of Columbia. Data for Oklahoma were excluded, because Oklahoma did not include an item on Hispanic origin on its death certificate. In computing infant mortality rates, deaths and live births of unknown origin are not distributed among the specified Hispanic and non-Hispanic groups. Because the percent of infant deaths of unknown origin for 1994 was 1.3 percent and the percent of live births of unknown origin was 1.1 percent, infant mortality rates by specified Hispanic origin and race for non-Hispanic origin may be slightly underestimated.

Small numbers of infant deaths for specific Hispanic-origin groups can result in infant mortality rates subject to relatively large random variation (see "Random variation and sampling errors").

Tabulation list--Causes of death for infants are tabulated according to a list of causes that is different from the list of causes for the population of all ages, except for the Each Cause List. (See "Cause-of-death classification" under "Cause of death.")

Fetal deaths

In May 1950 WHO recommended the following definition of fetal death be adopted for international use:

> Death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation, the fetus does not breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles (38).

The term "fetal death" was defined on an all-inclusive basis to end confusion arising from the use of such terms as stillbirth, spontaneous abortion, and miscarriage.

Shortly thereafter, this definition was adopted by NCHS as the nationally recommended standard. All registration areas except Puerto Rico have definitions similar to the standard definition (39). Puerto Rico has no formal definition.

As another step toward increasing comparability of data on fetal deaths for different countries, WHO recommended that for statistical purposes fetal deaths be classified as early, intermediate, and late. These groups are defined as follows:

Less than 20 completed weeks of gestation
(early fetal deaths).....Group I
20 completed weeks of gestation but less than 28
(intermediate fetal deaths).....Group II
28 completed weeks of gestation and over
(late fetal deaths).....Group III
Gestation period not classifiable in groups I, II, and III.....Group IV

Group IV consists of fetal deaths with gestation not stated but presumed to be 20 weeks or more.

Until 1939 the nationally recommended procedure for registration of a fetal death required the filing of a live-birth certificate and a death certificate. In 1939 a separate Standard Certificate of Stillbirth (fetal death) was created to replace the former procedure. This was revised in 1949, 1956, 1968, 1978, and 1989. The 1989 U.S. Standard Report of Fetal Death is shown as figure 7-B.

The 1977 revision of the *Model State Vital Statistics Act and Model State Vital Statistics Regulations* (40) recommended spontaneous fetal deaths at a gestation of 20 weeks or more or a weight of 350 grams or more be reported and further be reported on separate forms. These should be considered legally required statistical reports rather than legal documents. The 1992 revision of the *Model State Vital Statistics Act and Regulations* (41) recommended all spontaneous fetal deaths weighing 350 grams or more, or if weight is unknown, fetal deaths of 20 completed weeks of gestation be reported.

Beginning with fetal deaths reported in 1970, procedures were implemented that attempted to separate reports of spontaneous fetal deaths from those of induced terminations of pregnancy. These procedures were implemented because the health implications of spontaneous fetal deaths are different from those of induced terminations of pregnancy. These procedures are still used.

Comparability and completeness of data--Registration area requirements for reporting fetal deaths vary. Most of the areas require reporting of fetal death at gestations of 20 weeks or more. Table C shows the minimum period of gestation required by each State to report a fetal death in 1994. Substantial evidence exists that indicates some fetal deaths for which reporting is required are not reported (42,43).

Underreporting of fetal deaths is most likely to occur in the earlier part of the required reporting period for each State (42). Thus, for States requiring reporting of all periods of gestation, fetal deaths occurring under 20 weeks of gestation are less completely reported; for States requiring reporting of fetal deaths of 20 weeks or more, fetal deaths occurring at 20-23 weeks are less completely reported. Thus, reporting of fetal deaths at 20-23 weeks of gestation may be more complete for those States that report fetal deaths at all periods of gestation than for others.

To maximize the comparability of data by year and by State, most of the tables on fetal deaths are based on fetal deaths occurring at gestations of 20 weeks or more. These tabulations also include fetal deaths for which gestation is not stated for those States requiring reporting at 20 weeks of gestation or more only. Beginning with 1969 fetal deaths of not stated gestation were excluded for States requiring reporting of all products of conception except for those with a stated birthweight of 500 grams or more. In 1994 this rule was applied to the following States: Georgia, Hawaii, New York (including New York City), Rhode Island, and Virginia. Each year there are exceptions to this procedure.

Delaware--Beginning in July 1992, Delaware changed its reporting requirements for spontaneous fetal deaths from 20 weeks of gestation or more to 350 grams or more (table C). If weight is unknown, all fetal deaths of 20 weeks of gestation or more should be reported.

Montana--Beginning in October 1991, Montana changed its reporting requirements for spontaneous fetal deaths from 20 weeks of gestation or more to 20 weeks of gestation or more or 500 grams (table C).

New York City--As a result of local efforts to improve reporting, a combined total of 10,470 additional 1990 and 1991 fetal death records were sent from New York City hospitals after the data files had been processed and tabulated. Most of these records are for fetal deaths under 20 weeks of gestation or not-stated gestation. Tables for 1991 may exclude the additional deaths.

Revised Report of Fetal Death for 1989--Beginning with data for 1989, new items were added to the U.S. Standard Report of Fetal Death, including Hispanic origin of the mother and father, medical and other risk factors of pregnancy, obstetric procedures, and method of delivery. In addition, questions on complications of labor and/or delivery and congenital anomalies of fetus were changed from an open-ended question to a checkbox format to ensure more complete reporting of information (44).

Interpretation of these data must include evaluation of the item completeness of reporting. The percent "not stated" is one measure of the quality of the data. Completeness of reporting varies among items and States. See table D for the percent of fetal death records on which specified items were not stated.

The tabulation of items is limited to those States whose reporting is sufficiently complete. For fetal deaths before data year 1991, data were published when a State had a response for the item on at least 20 percent of the records. Beginning in data year 1991, tabulations of prenatal care and educational attainment include only those

States with a response for that specific item on at least 80 percent of the fetal death records. For other tabulations of fetal death, item completion is high (table D) and no reporting criterion is used to exclude States.

Period of gestation--The period of gestation is the number of completed weeks elapsed between the first day of the last normal menstrual period (LMP) and the date of delivery. The first day of the LMP is used as the initial date because it can be more accurately determined than the date of conception, which usually occurs 2 weeks after LMP. Data on period of gestation are computed from information on "date of delivery" and "date last normal menses began." If "date last normal menses began" is not on the record or if the calculated gestation falls beyond a duration considered biologically plausible, the "Physician's estimate of gestation" is used.

To improve data quality, beginning with data for 1989, NCHS instituted a new computer edit to check for consistency between gestation and birthweight (45). Briefly, if LMP gestation is inconsistent with birthweight, and the physician's estimate is consistent, the physician's estimate is used; if both are inconsistent with birthweight but are consistent with each other, LMP gestation is used, and birthweight is assigned to unknown. When the period of gestation is reported in months on the report, it is allocated to gestational intervals in weeks as follows:

1-3 months to under 16 weeks
4 months to 16-19 weeks
5 months to 20-23 weeks
6 months to 24-27 weeks
7 months to 28-31 weeks
8 months to 32-35 weeks
9 months to 40 weeks
10 months and over to 43 weeks and over

All areas reported LMP in 1994, and all areas except California, Louisiana, Maryland, and Oklahoma reported physician's estimate of gestation.

Birthweight--Most of the 55 registration areas do not specify how weight should be given, that is, in pounds and ounces or in grams. In the tabulation and presentation of birthweight data, the metric system (grams) has been used to facilitate comparison with other data published in the United States and internationally. Birthweight specified in pounds and ounces is assigned the equivalent of the gram intervals, as follows:

Less than 350 grams = 0 lb 12 oz or less
350-499 grams = 0 lb 13 oz-1 lb 1 oz
500-999 grams = 1 lb 2 oz-2 lb 3 oz
1,000-1,499 grams = 2 lb 4 oz-3 lb 4 oz
1,500-1,999 grams = 3 lb 5 oz-4 lb 6 oz
2,000-2,499 grams = 4 lb 7 oz-5 lb 8 oz
2,500-2,999 grams = 5 lb 9 oz-6 lb 9 oz
3,000-3,499 grams = 6 lb 10 oz-7 lb 11 oz
3,500-3,999 grams = 7 lb 12 oz-8 lb 13 oz
4,000-4,499 grams = 8 lb 14 oz-9 lb 14 oz
4,500-4,999 grams = 9 lb 15 oz-11 lb 0 oz
5,000 grams or more = 11 lb 1 oz or more

With the introduction of ICD-9, the birthweight classification intervals for perinatal mortality statistics were shifted downward by 1 gram as shown above. Previously, the intervals were, for example, 1,001-1,500, 1,501-2,000, and so forth. Beginning in 1989 NCHS instituted a consistency check between birthweight and gestation; see previous section on gestation.

Race--Beginning with data for 1989, NCHS changed the method of tabulating fetal death, perinatal, and live birth data by race from race of parents to race of mother. When the race of the mother is unknown, the mother is assigned the father's race; when information for both parents is missing, the race of the mother is assigned to the specific race of the mother of the preceding record with known race.

The change in tabulation of race has resulted in a discontinuity in fetal mortality rates by race for data year 1989-94 relative to previous years; see "Change in tabulation of race data for live births and fetal deaths," under "Infant deaths" or the series report, "Effect on Mortality Rates of the 1989 Change in Tabulating Race" (29).

Hispanic origin of mother--Fetal mortality data for the Hispanic-origin population are based on fetal deaths to mothers of Hispanic origin who were residents of those States and the District of Columbia that included items on the report of fetal death to identify Hispanic or ethnic origin of mother. Data for 1994 were obtained from 46 States and the District of Columbia; areas not supplying data were Louisiana, Maryland, Massachusetts, and Oklahoma. Of the reporting areas, only 42 States and the District of Columbia had an item on Hispanic or ethnic origin on the death certificate, birth certificate, and report of fetal death whose data for all three files were at least 80 percent complete on a place-of-occurrence basis and considered to be sufficiently comparable to be used for analysis. These 42 States and the District of Columbia accounted for about 96 percent of the Hispanic population in 1990, including 99 percent of the Mexican population, 87 percent of the Puerto Rican population, 97 percent of the Cuban population, and 93 percent of the "Other Hispanic" population (11). (See also "Hispanic origin" under "Classification of data.") The States excluded are Connecticut, Louisiana, Maine, Maryland, Massachusetts, New Hampshire, Oklahoma, and Rhode Island.

Total-birth order--Total-birth order refers to the sum of live births and other terminations (including spontaneous fetal deaths and induced terminations of pregnancy) a woman has had, including the fetal death being recorded. For example, if a woman has given birth to two live babies and to one born dead, the next fetal death to occur is counted as number four in total-birth order.

Beginning with implementation of the 1989 revision of the U.S. Standard Report of Fetal Death, total-birth order is calculated from three items on pregnancy history: Number of previous live births now living; number of previous live births now dead; and number of other terminations (spontaneous and induced at anytime after conception). For prior years total-birth order was calculated from four items, see the Technical Appendix from *Vital Statistics of the United States*, 1988.

Although all registration areas use the two standard items pertaining to number of previous live births, registration areas phrase the item pertaining to other terminations of pregnancy differently. Total-birth order for all areas is calculated from the sum of available information. Thus, information on total-birth order may not be completely comparable among the registration areas. In addition, there may be substantial underreporting of other terminations of pregnancy on the fetal-death report.

Marital status--Fetal deaths and fetal mortality rates by mother's marital status are based on data from 43 States and the District of Columbia. Reports of fetal death for the remaining seven States--California, Connecticut, Maryland, Michigan, Nevada, New York (including New York City), and Texas--did not include an item on marital status.

Beginning with data for 1989, fetal-death reports with marital status not stated are shown as not stated in frequencies, but are proportionally distributed for rate computations into either the married or unmarried categories according to the percent of fetal-death reports with stated marital status that fall into each category for the reporting States. Before 1989 fetal-death reports with not-stated marital status were assigned to the married category. Because of this change, fetal-death frequencies and rates by marital status for 1989-94 are not strictly comparable with those for previous years.

No quantitative data exist on the characteristics of unmarried women who do not report, misreport their marital status, or fail to register fetal deaths. Underreporting may be greater for the unmarried group than for the married group.

Age of mother--Beginning with data for 1989, the U.S. Standard Report of Fetal Death asks for the mother's date of birth. Age of mother is computed from the mother's date of birth and the date of the termination of the pregnancy. For those States whose certificates do not contain an item for the mother's date of birth, reported age of the mother (in years) is used. The age of the mother is edited in NCHS for upper and lower limits. When mothers are reported to be under 10 years of age or 50 years of age and over, the age of the mother is considered not stated and is assigned as follows: Age on all fetal-death records with age of mother not stated is assigned according to the age appearing on the record previously processed for a mother of identical race and having the same total-birth order (total of live births and other terminations).

Sex of fetus--Beginning with data for 1989, for all fetal deaths of 20 weeks of gestation or more, not-stated sex of fetus is assigned the sex of the fetus from the previous record. Before 1989 no such assignment was made.

Plurality--All registration areas except Louisiana report the plurality of the fetus. Although Louisiana has not reported this item for many years, before 1989, data for Louisiana were erroneously converted to a plurality of 1 (single birth) and included in United States totals. Beginning with 1989 data, Louisiana is excluded from tables reporting plurality of the fetus. For reporting areas, not-stated plurality of the fetus is assigned to single births.

Perinatal mortality

Perinatal definitions--Beginning with data year 1979, perinatal mortality data have been published for the United States and each State. WHO recommends in ICD-9, “national perinatal statistics should include all fetuses and infants delivered weighing at least 500 grams (or when birthweight is unavailable, the corresponding gestational age (22 weeks) or body length (25 cm crown-heel)), whether alive or dead. . . .” It further recommends, “countries should present, solely for international comparisons, ‘standard perinatal statistics’ in which both the numerator and denominator of all rates are restricted to fetuses and infants weighing 1,000 grams or more (or, where birthweight is unavailable, the corresponding gestational age (28 weeks) or body length (35 cm crown-heel)).” Because birthweight and gestational age are not reported on the death certificate in the United States, NCHS was unable to adopt these definitions. Three definitions of perinatal mortality are used by NCHS: Perinatal Definition I, generally used for international comparisons, which includes fetal deaths of 28 weeks of gestation or more and infant deaths under 7 days; Perinatal Definition II, which includes fetal deaths of 20 weeks of gestation or more and infant deaths under 28 days; and Perinatal Definition III, which includes fetal deaths of 20 weeks of gestation or more and infant deaths under 7 days.

Variations in fetal death reporting requirements and practices have implications for comparing perinatal rates among States. Because reporting is generally sporadic near the lower limit of the reporting requirement, States that require reporting of all products of pregnancy, regardless of gestation, are likely to have more complete reporting of fetal deaths at 20 weeks or more than those States that do not. The larger number of fetal deaths reported for these “all periods” States may result in higher perinatal mortality rates than those rates reported for States whose reporting is less complete. Accordingly, reporting completeness may account, in part, for differences among the State perinatal rates, particularly differences for Definitions II and III, which use data for fetal deaths at 20-27 weeks.

Not stated--Fetal deaths with gestational age not stated are presumed to be of 20 weeks of gestation or more if the State requires reporting of all fetal deaths at a gestational age of 20 weeks or more or the fetus weighed 500 grams or more in those States requiring reporting of all fetal deaths, regardless of gestational age. For Definition I, fetal deaths at a gestation not stated but presumed to have been of 20 weeks or more are allocated to the category 28 weeks or more, according to the proportion of fetal deaths with stated gestational age that falls into that category. For Definitions II and III, fetal deaths at a presumed gestation of 20 weeks or more are included with those at a stated gestation of 20 weeks or more.

The allocation of not-stated gestational age for fetal deaths is made individually for each State, for metropolitan and nonmetropolitan areas, and separately for the entire United States. Accordingly, the sum of

perinatal deaths for the areas according to Definition I may not equal the total number of perinatal deaths for the United States.

Race--Beginning with the 1989 data year, NCHS changed the method of tabulating fetal-death and live-birth data by race from race of parents to race of mother. This has resulted in a discontinuity in perinatal mortality rates by race between 1989-94 data and those for previous years; see "Change in tabulation of race data for live births and fetal deaths" under "Infant deaths."

Hispanic origin--See "Hispanic origin of mother" under "Fetal deaths."

Quality of data

Completeness of registration

All States have adopted laws requiring the registration of births and deaths and the reporting of fetal deaths. It is believed that more than 99 percent of the births and deaths occurring in this country are registered.

Reporting requirements for fetal deaths vary from State to State (see "Comparability and completeness of data"). Overall reporting is not as complete for fetal deaths as for births and deaths, but it is believed to be relatively complete for fetal deaths at a gestation of 28 weeks or more. National statistical data on fetal deaths include only fetal deaths occurring at a stated or presumed gestation of 20 weeks or more.

Massachusetts data--The 1964 statistics for deaths exclude approximately 6,000 deaths registered in Massachusetts, primarily to residents of that State. Microfilm copies of these records were not received by NCHS. Figures for the United States and the New England Division are affected also.

Amended records for Alaska--Numbers of deaths occurring in Alaska for 1994 are in error for all causes of death combined and for selected causes because NCHS did not receive changes resulting from amended records. An estimate of the effect of these omissions can be derived by comparing NCHS counts of records processed through the VSCP with counts prepared by Alaska as shown in table E. Differences are concentrated among selected causes of death, principally Symptoms, signs, and ill-defined conditions (ICD-9 Nos. 780-799) and external causes.

Quality control procedures

Demographic items on the death certificate--As previously indicated, for 1994 the mortality data for these items were obtained from two sources--photocopies of the original certificates furnished by Guam and electronic data records furnished by the 50 States, the District of Columbia, New York City, Puerto Rico, and the Virgin Islands. For Guam, which sent only copies of the original certificates, the demographic items were coded for 100 percent of the death certificates. The demographic coding for 100 percent of the certificates was independently verified.

For areas sending electronic data records, a sample of 70-80 records per month for each registration area is used to monitor quality of coding. Under this procedure, each sample record is independently coded by NCHS staff and compared to the State code assignments. NCHS/State differences are adjudicated to ascertain the source of the error and need for corrective action. The estimated average outgoing error rate for all demographic items in 1994 was 0.25 percent. The error rate is a combined measure of State coding, key entry and processing errors made in the process of preparing the statistical file. These types of errors are not necessarily randomly distributed in the file and may therefore escape detection through sample verification. To reduce some systematic errors other NCHS procedures such as detailed computer edits, tabular evaluation, and procedure review are used.

Medical items on the death certificate--The same procedures used for demographic data are used for the medical items. For the 40 States sending electronic files, the average outgoing error rate in 1994 was estimated at 2.6 percent for underlying cause data, and 5.2 percent for multiple cause-of-death data.

For the remaining 10 States, the District of Columbia, New York City, Puerto Rico, the Virgin Islands, and Guam, NCHS coded the medical items for all the death records. A 1-percent sample of the records was coded independently for quality control purposes. The estimated average error rate for these areas was 4.3 percent.

Demographic items on the report of fetal death---As previously indicated, for 1994 the fetal-death demographic data were obtained from two sources: Coded records in electronic form from 47 registration areas and photocopies of the original certificates furnished by the remaining registration areas. For the eight registration areas submitting photocopies, NCHS coded the records. State-coded records may incorporate corrections made to the records as a result of queries whereas items from photocopies would be less likely to incorporate all corrections.

Beginning with data year 1993, quality control for fetal-death data was limited to computer edit checks, code validations, and comparisons of tabulated data with that for the previous year. Dual-coding of a sample of fetal-death records was not performed because of resource constraints.

Other control procedures--After coding and data entry are completed, record counts are balanced against control totals for each shipment of records from a registration area. Editing procedures ensure that records with inconsistent or impossible codes are modified. Inconsistent codes are those, for example, indicating a contradiction between cause of death and age or sex of the decedent. Records so identified during the computer editing process are either corrected by reference to the source record or adjusted by arbitrary code assignment (46). Further, conditions specified on a list of infrequent or rare causes of death are confirmed by the certifier or a State health officer. All subsequent operations in tabulating and in preparing tables are verified during the computer processing or by statistical clerks.

Estimates of errors arising from 50-percent sample for 1972--Death statistics for 1972 (excluding fetal-death statistics) are based on a 50-percent sample of all deaths occurring in the 50 States and the District of Columbia. A description of the sample design and a table of the percent errors of the estimated numbers of deaths by size of estimate and total deaths in the area are shown in the Technical Appendix from *Vital Statistics of the United States*, 1972.

Computation of rates and other measures

Population bases

Population bases from which death rates are computed are prepared by the U.S. Bureau of the Census. Rates for 1940, 1950, 1960, 1970, 1980, and 1990 are based on the population enumerated as of April 1 in the censuses for those years. Rates for all other years use the estimated midyear (July 1) population. Death rates for the United States, individual States, and metropolitan areas are based on the total resident populations of the respective areas. Except as noted, these populations exclude the Armed Forces abroad but include the Armed Forces stationed in each area.

The resident populations of the birth- and death-registration States for 1900-32, and of the United States for 1933-94 are shown in Table F. In addition, the population including Armed Forces abroad is shown for the United States. Table G lists the sources for these populations.

Populations for 1994--Population estimates of the United States by age, race, and sex for 1994 are shown in Table H. The 1994 estimates are consistent with those for 1990-93. Population estimates for each State by age for 1994 are shown in Table I. Since these population estimates are based on demographic analysis, they are not subject to sampling variability.

In addition the following estimates are shown:

- Estimated population by 5-year age groups, specified Hispanic origin, race for non-Hispanic origin, and sex: Total of 49 States and the District of Columbia, 1994 (see Table J)
- Estimated population for ages 15 years and over by 5-year age groups, marital status, race, and sex: United States, 1994 (see Table K)
- Estimated population for ages 15 years and over by 5-year age groups, marital status, Hispanic origin, race for non-Hispanic origin, and sex: Total of 49 States and the District of Columbia, 1994 (see Table L)

Population estimates by specified Hispanic origin, by educational attainment, and by marital status groups are based on the Bureau of the Census' Current Population Survey (a sample-based survey) adjusted to control totals. As a result, these estimates are subject to sampling variation (see "Random variation and sampling errors").

Population for 1990--In the 1980 and 1990 censuses, a substantial number of persons did not specify a racial group that could be classified as any of the white, black, American Indian, Eskimo, Aleut, Asian, or Pacific Islander categories on the census form (47). In 1980 the number of persons of "Other" race was 6,758,319; in 1990, it was 9,804,847. In both censuses the large majority of these persons were of Hispanic origin (based on responses to a separate question on the form), and many wrote in their Hispanic origin (for example, Mexican and Puerto Rican) as their race. In 1980 and 1990 persons of unspecified race were allocated to one of the four tabulated racial groups (white, black, American Indian, Asian or Pacific Islander) based on their response to the Hispanic origin question. These four race categories conform with OMB Directive 15 (the standards for recordkeeping, collection, and presentation of data on race and ethnicity in Federal statistical activities and program administrative reporting) (48) and are more consistent with the race categories in vital statistics.

In 1980 the allocation of unspecified race was determined using cross-tabulations of age, sex, race, specified Hispanic origin, and county of residence. Persons of Hispanic origin and unspecified race were allocated to either white or black based on their specific Hispanic origin. Persons of "Other" race and Mexican origin were categorically assumed to be white, while persons in other Hispanic categories were distributed to white and black pro rata within the county-age-sex group. For "Other race-not-specified" persons who were not Hispanic, race was allocated to white, black, or Asian or Pacific Islander based on proportions gleaned from sample data. The 20-percent sample (respondents who were enumerated on the longer census form) provided a highly detailed coding of race, which allowed identification of otherwise unidentifiable responses with a specified race category. Thus, allocation proportions were established at the State level and were used to distribute the non-Hispanic persons of "Other" race in the 100-percent tabulations.

In 1990 the race modification procedure was implemented using individual census records. Persons whose race could not be specified were assigned to a racial category using a pool of "race donors" that consisted of persons of specified race who had the identical responses to the Hispanic origin question and who were within the auspices of the same census district office. As in the 1980 census, it appeared that the underlying assumption made in the 1990 census was that the Hispanic origin response was the major criterion for allocating race. Unlike those responding to the 1980 census who could be assigned only to the racial group white or black, persons of Hispanic origin, including Mexicans, responding to the 1990 census could be assigned to any racial group. Also, in the 1990 census, the non-Hispanic component of "Other" race was allocated primarily on the basis of geography (district office), rather than detailed characteristic.

The means by which respondent's age was determined were fundamentally different for the two censuses; therefore, the problems that necessitated the modification were different. In 1980 respondents reported year of birth and quarter of birth (within year) on the census form. When census results were tabulated, persons born in the first quarter of the year (before April 1) had age equal to 1980 minus year of birth, while persons born in the last three quarters had age equal to 1979 minus year of birth.

In 1990 quarter year of birth was not reported on the census form, so direct determination of age from year of birth was not possible. In 1990 census publications, age is based on respondents' direct reports of age at last birthday. This definition proved inadequate for postcensal estimates as it was apparent that many respondents had reported their age at time of either completion of the census form or interview by an enumerator that could occur several months after the April 1 reference date. As a result, age was biased upward. For most respondents, modification was based on a respecification of age, by year of birth, with allocation to first quarter (persons aged 1990 minus year of birth) and last three quarters (aged 1989 minus year of birth) based on a historical series of registered births by month. This process partially restored the 1980 logic for assignment of age. It was not considered necessary to correct for age overstatement and heaping in 1990, because the availability of age and year of birth on the census form had provided for the elimination of spurious year-of-birth reports in the census data before modification occurred.

Population estimates for 1981-89--Death rates for 1981-89 are based on revised populations that are consistent with the 1990 census level (47). They are, therefore, not comparable with death rates published in *Vital Statistics of the United States* for 1981-89, and in other NCHS publications for those years. The 1990 census counted approximately 1.5 million fewer persons than had been estimated earlier for April 1, 1990.

Populations for 1980--Death rates for 1980 are based on the population enumerated as of April 1 in the 1980 census (49). The figures by race have been modified as described.

Population estimates for 1971-79--Death rates for 1971-79 used revised population estimates that are consistent with the 1980 census levels. The 1980 census enumerated approximately 5.5 million more persons than had been estimated for April 1, 1980 (50). These revised estimates for the United States by age, race, and sex are published by the U.S. Bureau of the Census in *Current Population Reports*, Series P-25, Number 917. Unpublished revised estimates for States were obtained from the U.S. Bureau of the Census. For Puerto Rico, the Virgin Islands, and Guam, revised estimates are published in *Current Population Reports*, Series P-25, Number 919.

Population estimates for 1961-69--Death rates for 1961-69 are based on revised estimates of the population and thus may differ slightly from rates published before 1976. Rates, life table values, and population estimates for each year during 1961-69 have been revised to reflect modified population bases as published in the U.S. Bureau of the Census, *Current Population Reports*, Series P-5, Number 519.

Rates and ratios based on live births--Infant and maternal mortality rates and fetal-death and perinatal mortality ratios are computed on the basis of the number of live births. Fetal-death and perinatal mortality rates are computed on the basis of the number of live births and fetal deaths. Counts of live births are published annually in *Vital Statistics of the United States*.

New Jersey--As previously indicated, data by race are not available for New Jersey for 1962 and 1963. Therefore, for 1962 and 1963, NCHS estimated a population by age, race, and sex that excluded New Jersey for rates shown by race. The methodology used to estimate the revised population excluding New Jersey is discussed in the Technical Appendixes of the 1962 and 1963 volumes.

Net census undercount

Errors can be introduced into the annual rates as a result of underenumeration of deaths and the misreporting of demographic characteristics. Errors in rates can also result from enumeration errors in the latest decennial census. This is because annual population estimates for the postcensal interval, which are used in the denominator for calculating death rates, are computed using the decennial census count as a base (47). Net census undercount results from the miscounting and misreporting of demographic characteristics such as age. Age-specific death rates are affected by the net census undercount and the misreporting of age on the death certificate (51). To the extent that the net undercount is substantial and that it varies among subgroups and geographic areas, it may have important consequences for vital statistics measures.

Because death rates based on a population adjusted for net census undercount may be more accurate than rates based on an unadjusted population, the possible impact of net census undercount on death rates must be considered. This can be done on a national basis using results of studies conducted by the U.S. Bureau of the Census on the completeness of coverage of the U.S. population (including underenumeration and misstatement of age, race, and sex). Such studies were conducted in the last five decennial censuses--1950, 1960, 1970, 1980, and 1990. From this work have come estimates of the national population that were not counted by age, race, and sex (52-55). The reports for 1990 (unpublished data from the U.S. Bureau of the Census) include estimates of net underenumeration and overenumeration for age, sex, and racial subgroups of the national population modified for race consistency with previous population counts as described in the section "Population bases." These studies indicate that, although coverage was improved over previous censuses, there was differential coverage among the population subgroups; that is, some age, race, and sex groups were more completely counted than others.

Because estimates of net census undercount are not available by age, race, and sex for individual States and counties, it is not feasible to adjust for net census undercount when presenting rates in routine tabulations. Nevertheless, it is important to be aware that net census undercounts can affect levels of observed vital rates.

Age, race, and sex--If adjustments were made for net census undercount, the size of denominators of the death rates generally would increase and the rates, therefore, would decrease. The adjusted rates for 1994 can be computed by multiplying the reported rates by ratios of the census-level resident population to the resident population adjusted for the estimated net census undercount (table M). A ratio of less than 1.0 indicates a net census undercount and, when applied, results in a corresponding decrease in the death rate. A ratio greater than 1.0--indicating a net census overcount--when multiplied by the reported rate results in an increase in the death rate.

Coverage ratios for all ages show that, in general, females were more completely enumerated than males and the white population more completely enumerated than the black population in the 1990 Census of Population. Underenumeration varied by age group for the total population, with the greatest differences found for persons aged 85 years and over. All other age groups were overcounted or undercounted by less than 4.0 percent. Among the age-sex-race groups, underenumeration was highest (13.3 percent) for black males aged 25-34 years. In contrast, white females in this age group were underenumerated by 2.5 percent.

If vital statistics measures were calculated with adjustments for net census undercounts for each population subgroup, the resulting rates would be differentially reduced from their original levels; that is, rates for those groups with the greatest estimated undercounts would show the greatest relative reductions due to these adjustments. Similar effects would be evident in the opposite direction for groups with overcounts. Consequently, the ratio of mortality between the rates for males and females and between the rates for the white population and the black population usually would be reduced.

Similarly, the differences between the death rates among subgroups of the population by cause of death would be affected by adjustments for net census undercounts. For example, in 1990 for the age group 35-39 years, the ratio of the unadjusted death rate for Homicide and legal intervention for black males to that for white males is 7.54, whereas the ratio of the death rates adjusted for net census undercount is 6.92. For Ischemic heart disease for males aged 40-44 years, the ratio of the death rate for the black population to that for the white population is 1.38 using the unadjusted rates, but it is 1.26 when adjusted for estimated underenumeration.

Summary measures--The effect of net census undercount on age-adjusted death rates and life table values depends on the underenumeration of each age group and on the distribution of deaths by age. Thus, the age-adjusted death rate in 1990 for All causes would decrease from 520.2 to 512.7 per 100,000 population if the age-specific death rates were corrected for net census undercount (table N). For Diseases of heart, the age-adjusted death rate for white males would decrease from 202.0 to 198.2 per 100,000 population, a decline of 2.0 percent. For black males, the change from an unadjusted rate of 275.9 to an adjusted rate of 256.7 would amount to a decrease of 7.0 percent. For HIV infection, the rate for black males would decrease from 44.2 to 39.0 and for white males from 15.0 to 14.4.

If death rates by age were adjusted, the corresponding life expectancy at birth computed from these rates would change. When calculating life expectancy, the impact of an undercount or overcount is greatest at the younger ages. In general, the effect of correcting the death rates is to increase the estimate of life expectancy at birth. For example, adjustment for net census undercount would increase life expectancy in 1990 by an estimated 0.2 years, from 75.4 years to 75.6 years for the total U.S. population.

Adjustment for differential underenumeration among race-sex groups would lead to greater changes in life expectancy for some groups than for others. For males and females, increases would be 0.3 and 0.1 years, respectively; for the black population and white population, 0.6 and 0.2 years, respectively. The largest increase would be for black males, 1.2 years, followed by white males (0.3 years), black females (0.2 years), and white females (0.2 years).

Age-adjusted death rates

Age-adjusted death rates are used to compare relative mortality risk across groups and over time. However, they should be viewed as constructs or indexes rather than as direct or actual measures of mortality risk. Statistically, they are weighted averages of the age-specific death rates, where the weights represent the fixed population proportions by age (56). Age-adjusted death rates were computed by the direct method, that is, by applying age-specific death rates for a given cause of death to the U.S. standard population (relative age distribution of 1940 enumerated population of the United States totaling 1,000,000 (31)). By using the same standard population, the rates for the total population and for each race-sex group were adjusted separately. It is important not to compare age-adjusted death rates with crude rates. The U.S. standard population and corresponding weights (w_i) are as follows:

Age	Number	Weights (w_i)
All ages.....	1,000,000	1.000000
Under 1 year.....	15,343	0.015343
1-4 years.....	64,718	0.064718
5-14 years.....	170,355	0.170355
15-24 years.....	181,677	0.181677
25-34 years.....	162,066	0.162066
35-44 years.....	139,237	0.139237
45-54 years.....	117,811	0.117811
55-64 years.....	80,294	0.080294
65-74 years.....	48,426	0.048426
75-84 years.....	17,303	0.017303
85 years and over.....	2,770	0.002770

Age-adjusted death rates by marital status are computed using the age groups 25 years and over. Therefore, the United States standard population aged 25 years and over and corresponding weights (w_i) are as follows:

Age	Number	Weights (w_i)
25 years and over	567,907	1.000000
25-34 years	162,066	0.285374
35-44 years	139,237	0.245176
45-54 years	117,811	0.207448
55-64 years	80,294	0.141386
65-74 years	48,426	0.085271
75 years and over	20,073	0.035346

Life tables

U.S. abridged life tables are constructed by reference to a standard table (57). Life tables for the decennial period 1979-81 are used as the standard life tables in constructing the 1980-94 abridged life tables. Life table values for 1981-89 are based on revised intercensal estimates of the populations for those years. Therefore, these life table values may differ from life table values of those years published previously.

Life tables for the decennial period 1969-71 are used as the standard life tables in constructing the 1970-79 abridged life tables. Life table values for 1970-73 were first revised in *Vital Statistics of the United States*, 1977; before 1977, life table values for 1970-73 were constructed using the 1959-61 decennial life tables. In addition, life table values for 1951-59, 1961-69, and 1971-79 are based on revised intercensal estimates of the populations for those years. As such, these life table values may differ from life table values previously published.

The annual abridged life table series was initiated for selected race-sex groups in 1945. Because of the increased interest in the average length of life ($^{o}e_{o}$) for years prior to 1945, estimates were prepared for the following race and sex groups and data years (58).

Years	*Race and sex groups*
1900-45	Total
1900-47	Male
1900-47	Female
1900-50	White
1900-44	White, male
1900-44	White, female
1900-50	All other
1900-44	All other, male
1900-44	All other, female

The geographic areas covered in life tables before 1929-31 were limited to the death-registration areas. Life tables for 1900-02 and 1909-11 were constructed using mortality data from the 1900 death-registration States--10 States and the District of Columbia, and for 1919-21, from the 1920 death-registration States--34 States and the District of Columbia. The tables for 1929-31 through 1958 cover the conterminous United States. Decennial life table values for the 3-year period 1959-61 were derived from data that include Alaska and Hawaii for each year. Data for each year include Alaska beginning in 1959 and Hawaii beginning in 1960. It is believed that the inclusion of these two States does not materially affect life table values.

Random variation and sampling errors

Deaths--The number of deaths reported for an area represent complete counts of such events (except for 1972 when the data were based on a 50-percent sample because of resource constraints). As such, they are not subject to sampling error, although they are subject to non-sampling errors in the registration process. However, when the figures are used for analytical purposes, such as the comparison of rates over time or for different areas, the number of events that actually occurred may be considered as one of a large series of possible results that could have arisen under the same circumstances (59). The probable range of values may be estimated from the actual figures according to certain statistical assumptions.

In general, distributions of vital events may be assumed to follow the binomial distribution. When the number of events is large, the relative standard error is usually small. When the number of events is small (perhaps less than 100) 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. As a result, the numbers of deaths, death rates, and mortality rates are subject to random variation. Estimates of relative standard errors (RSE)--a measure of variability--, 95-percent confidence intervals, and tests of statistical significance under this assumption are shown below. Mortality data may also be subject to non-sampling errors.

Populations-Population estimates of the United States and for each State by age, race, total Hispanic origin, and sex for 1994 are based on demographic methods and, therefore, are not subject to sampling variability. However, population estimates by specified Hispanic origin (Mexicans, Puerto Ricans, Cubans, and Other Hispanics) and by specified marital status groups (never married, married, widowed, and divorced) are based on the Bureau of the Census' Current Population Survey (CPS) adjusted to control totals and, therefore, are subject to sampling variation. As a result, death rates based on the CPS-based population estimates are subject to both random variation of the deaths and sampling error of the population estimates. Estimates of relative standard errors, 95-percent confidence intervals, and tests of statistical significance under these assumptions are shown below. All population estimates may also be subject to non-sampling errors.

Computation of population-based death rates--Death rates for a single calendar year are computed by dividing the number of deaths for a class for that year by the population of a similarly-defined class for the same year and multiplying that result by 100,000 (or 1,000). Rates thus computed are per 100,000 (or 1,000) estimated population residing in selected areas of the United States. The 3-year average death rates are computed by dividing the total number of deaths for a class for a three-year period by the sum of the population estimates of a similarly defined class for the same period and multiplying that result by 100,000 (or 1,000).

Computation of live birth-based mortality rates--Maternal mortality rates and infant mortality rates are computed by dividing the number of deaths for a class for a specified year by the number of live births of a similarly defined class for that year and multiplying that result by 100,000 (or 1,000). Rates thus computed are per 100,000 (or 1,000) live births residing in selected areas of the United States. The 3-year average infant mortality rates for the three-year period are computed by dividing the total number of infant deaths for a class for that period by the sum of the live births of a similarly defined class for the three-year period and multiplying that result by 100,000 (or 1,000).

Relative Standard Errors and 95% Confidence Intervals--Formulas for computing approximate RSE's and confidence intervals (CI's) for crude, age-specific death rates, and age-adjusted death rates are shown below.

Beginning with 1989 data, an asterisk has been shown in place of a rate based on fewer than 20 deaths, which is the equivalent of an RSE of 22.94 percent or more. An RSE of this magnitude is considered statistically unreliable. That procedure has been used for mortality data except death rates based on CPS-based population estimates, for which sampling variation must be considered in addition to random variation. Statistical reliability testing for death rates based on sample population estimates were introduced beginning with specified Hispanic-origin data for 1994. This reliability testing is also applicable to rates by marital status.

VITAL STATISTICS OF THE UNITED STATES: MORTALITY, 1994
TECHNICAL APPENDIX

The formulas below are shown separately for rates based on demographically estimated populations, sample-based populations, and rates based on live births. Further, separate discussions are provided for rates based on less than 100 events, and rates based on 100 events or more. Specific examples are given to illustrate the use of the formulas.

*The following formulas are used for demographically-estimated population-based death rates for all races, white, black, American Indian, Asian or Pacific Islander, all origins, total Hispanic, total non-Hispanic, non-Hispanic white, non-Hispanic black for **all** marital status groups combined*:

Age-specific and crude death rates--

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

Approximate 95% Confidence Interval: 100 or more deaths
Lower: R - 1.96 * S(R)
Upper: R + 1.96 * S(R)

Approximate 95% Confidence Interval: 1-99 deaths
Lower: R * L(1- α =.95,D)
Upper: R * U(1- α =.95,D)

where

R = rate (deaths per 100,000 population)
D = total number of deaths upon which rate is based

$$S(R) = R * \frac{RSE(R)}{100} = \textit{standard error of rate}$$

L(1- α =.95,D) and U(1- α =.95,D) are lower and upper 95% confidence limit factors and are shown in Table O

Age-adjusted death rates--

$$RSE(R'') = 100 \frac{\sqrt{\sum\left\{ w_i^2 \; R_i^2 \left(\frac{1}{D_i} \right) \right\}}}{R''}$$

Approximate 95% Confidence Interval: 100 or more deaths
Lower: R'' - 1.96 * S(R'')
Upper: R'' + 1.96 * S(R'')

Approximate 95% Confidence Interval: 1-99 deaths
Lower: R'' * L(1- α =.95,D_{adj})
Upper: R'' * U(1- α =.95,D_{adj})

where

R'' = age-adjusted rate (per 100,000 population) = $\sum w_i R_i$
w_i = i^{th} age-specific Standard Population such that $\sum(w_i) = 1.0$
R_i = age-specific rate (per 100,000) for the i^{th} age group
D_i = total number of deaths for the i^{th} age group upon which age-specific rate is based

$$S(R'') = R'' * \frac{RSE(R'')}{100} = \textit{standard error of age-adjusted rate}$$

L(1- α =.95,D_{adj}) and U(1- α =.95,D_{adj}) are lower and upper 95% confidence limit factors and are shown in Table O

$$D_{adj} = \frac{1}{\left(\frac{RSE(R'')}{100} \right)^2} \textit{ adjusted number of deaths rounded to nearest integer}$$

*The following formulas are used for CPS population-based death rates for all races, white, black, American Indian, Asian or Pacific Islander, all origins, total Hispanic, total non-Hispanic, non-Hispanic white, non-Hispanic black by **specified** marital status group (never married, married, widowed, and divorced)*
OR
*for Mexican, Puerto Rican, Cuban, Other Hispanic for **all** marital status groups combined and by **specified** marital status group (never married, married, widowed, and divorced):*

Age-specific and crude death rates--

$$RSE(R) = 100\sqrt{\left(\frac{1}{D}\right) + f\left(a + \frac{b}{P}\right)}$$

Approximate 95% Confidence Interval: 100 or more deaths
Lower: R-1.96*S(R)
Upper: R+1.96*S(R)

Approximate 95% Confidence Interval: 1-99 deaths

$$Lower: \quad R * L\left(1-\alpha=.96,\ D\right) * \left(1-2.576\sqrt{f\left(a + \frac{b}{P}\right)}\right)$$

$$Upper: \quad R * U\left(1-\alpha=.96,\ D\right) * \left(1+2.576\sqrt{f\left(a + \frac{b}{P}\right)}\right)$$

where

R = rate (deaths per 100,000 population).
D = total number of deaths upon which rate is based
f = factor that depends on whether the population estimate is based on demographic analysis or CPS and the number of years used (see below)
a and b factors are CPS standard error parameters (see below)
P = total estimated population upon which rate is based (if rate is based on a 3-year average, then an approximate P would be three times the population for the most recent year)

$$S(R) = R * \frac{RSE(R)}{100} = standard\ error\ of\ rate$$

L(1- α =.96,D) and U(1- α =.96,D) are lower and upper 96% confidence limit factors and are shown in Table O

Age-adjusted death rates--

$$RSE(R'') = 100 \frac{\sqrt{\sum\left(w_i^2 * R_i^2 \left(\frac{1}{D_i} + f\left(a + \frac{b}{P_i}\right)\right)\right)}}{R''}$$

Approximate 95% Confidence Interval: 100 or more deaths
Lower: R'' - 1.96 * S(R'')
Upper: R'' + 1.96 * S(R'')

Approximate 95% Confidence Interval: 1-99 deaths
Lower: R'' * L(1- α =.96,D_{adj}) * (1 -2.576 * RSE(P_{adj}))
Upper: R'' * U(1- α =.96,D_{adj}) * (1+2.576 * RSE(P_{adj}))

where

R'' = age-adjusted rate (per 100,000 population) = $\sum w_i R_i$
w_i = i^{th} age-specific Standard Population such that $\sum(w_i) = 1.0$
R_i = age-specific rate (per 100,000)for the i^{th} age group
D_i = total number of deaths for the i^{th} age group upon which age-specific rate is based
f = factor that depends on whether the population estimate is based on demographic analysis or CPS and the number of years used (see below)
a and b factors are CPS standard error parameters (see below)
P_i = total estimated population for the i^{th} age group upon which the rate is based (if rate is based on 3-year average, then combined P_i would be three times the population for the most recent year)

$$S(R'') = R'' * \frac{RSE(R'')}{100} = \textit{standard error of age-adjusted rate}$$

L(1- α =.96,D_{adj}) and U(1- α =.96,D_{adj}) are lower and upper 96% confidence limit factors and are shown in Table O

P_{adj} =$\sum(w_i * P_i)$ = adjusted estimated population rounded to nearest integer

$$RSE(P_{adj}) = \frac{\sqrt{\sum\left(w_i^2 * P_i^2 * f\left(a + \frac{b}{P_i}\right)\right)}}{P_{adj}}$$

$$D_{adj} = \text{smaller of } \sum(D_i) \text{ or } \frac{1}{RSE(R'')^2 - RSE(P_{adj})^2} = \begin{array}{c}\text{adjusted number of deaths} \\ \text{rounded to the} \\ \text{nearest integer}\end{array}$$

If D_{adj} is negative, set D_{adj} to $\sum(D_i)$

Shown below are the "*a*", "*b*", and "*f*" factors for various race, origin, and marital status classifications, by whether the population-based rate was based on a single year or 3-year average:

Race, origin, and marital status	*Rate based on 1 year*	*Rate based on 3 years*
All races, white, American Indian, all origins, total Hispanic, total non-Hispanic, non-Hispanic white; by never married, married, widowed, divorced	*f* = 0.670 *a* = -0.000017 *b*= 4,786	*f* = 0.440 *a* = -0.000017 *b* = 14,358
Black, non-Hispanic black; by never married, married, widowed, divorced	*f* = 0.670 *a* = -0.000204 *b*= 6,865	*f* = 0.440 *a* = -0.000204 *b* = 20,595
Asian or Pacific Islander; by never married, married, widowed, divorced	*f* = 0.670 *a* = -0.000719 *b*= 6,865	*f* = 0.440 *a* = -0.000719 *b* = 20,595
Mexican, Puerto Rican, Cuban, Other Hispanic; all marital status groups combined, never married, married, widowed, divorced	*f* = 0.670 *a* = -0.000297 *b*= 6,865	*f* = 0.440 *a* = -0.000297 *b* = 20,595

The following formulas may be used for live birth-based mortality rates:

The formulas for the RSE and 95-percent CI's of an infant mortality rate (IMR) are as follows:

$$RSE(IMR) = 100\sqrt{\frac{1}{D} + \frac{1}{B}}$$

Approximate 95% Confidence Interval: 100 or more infant deaths
Lower: *IMR* - 1.96 * S(*IMR*)
Upper: *IMR* + 1.96 * S(*IMR*)

Approximate 95% Confidence Interval: 1-99 infant deaths
Lower: IMR * L(1- α =.95,D_{adj})
Upper: IMR * U(1- α =.95,D_{adj})

where

IMR = infant mortality rate (infant deaths per 100,000 live births)
D = total number of infant deaths upon which rate is based
B = total number of live births upon which IMR is based

$$S(IMR) = IMR * \frac{RSE(IMR)}{100} = \textit{standard error of infant mortality rate}$$

L(1- α =.95,D_{adj}) and U(1- α =.95,D_{adj}) are lower and upper 95% confidence limit factors and are shown in Table O

$$D_{adj} = \frac{D * B}{D + B} = \textit{adjusted number of infant deaths that takes into account the RSE of the number of infant deaths and live births}$$

Statistical tests

For testing the equality of two rates, R_1 and R_2, the *z*-test may be used (when both rates are based on 100 deaths or more) or the overlap of 95% CI's of the rates may be used (when either or both of the rates are based on less than 100 deaths).

The *z*-test is determined as follows:

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

to define a significance test statistic. If $|z|$ is greater than or equal 1.96, then the difference would be considered statistically significant at the 0.05 level; and if $|z|$ is less than 1.96, the difference is not statistically significant.

As a hypothetical example, if the three-year average death rate for Mexicans, R_1, is 36.4 (based on D=120 deaths and P=330,000 population for the three years combined) and the three-year rate for non-Hispanic whites, R_2, is 13.8 (based on D=180 deaths and P=1,300,000 population for the three years combined), then using the formulas above the RSE's and *z*-test are computed as follows:

$$RSE(R_1) = 100\sqrt{\frac{1}{120} + 0.440 * \left(-.000297 + \frac{20{,}595}{330{,}000}\right)} = 18.88\%$$

$$RSE(R_2) = 100\sqrt{\frac{1}{180}} = 7.45\%$$

and

$$z = \frac{36.4 - 13.8}{\sqrt{36.4^2\left(\frac{18.88}{100}\right)^2 + 13.8^2\left(\frac{7.45}{100}\right)^2}} = 3.25$$

Since $|z|$ is greater than 1.96, the difference between the two rates is statistically significant at the 0.05 level of significance.

If either of two rates is based on less than 100 deaths, then one may determine if the 95% CI's overlap as an indication of a statistically significant or non-significant difference.

As a hypothetical example, if the three-year average death rate for Cubans, R_3, is 26.7 (based on D=40 deaths and P=150,000 population for the three years combined) and the three-year rate for non-Hispanic blacks, R_4, is 61.5 (based on D=400 deaths and P=650,000 population for the three years combined), then the 95% CI's are computed using information from the following formulas and Table O:

95% CI for R_3

$$Lower: = 26.7 * 0.70266 \left(1 - 2.576 \sqrt{0.44 * \left(-.000297 + \frac{20{,}595}{150{,}000} \right)} \right) = 6.9$$

$$Upper: = 26.7 * 1.37991 \left(1 + 2.576 \sqrt{0.44 * \left(-.000297 + \frac{20{,}595}{150{,}000} \right)} \right) = 60.1$$

95% CI for R_4

$$RSE(R_4) = 100 \sqrt{\frac{1}{400}} = 5.00\%$$

$$Lower = 61.5 - \left(1.96 * 61.5 * \frac{5.00}{100} \right) = 55.5$$

$$Upper = 61.5 + \left(1.96 * 61.5 * \frac{5.00}{100} \right) = 67.5$$

Since the CI's overlap, the difference between R_3 and R_4 is not statistically significant.

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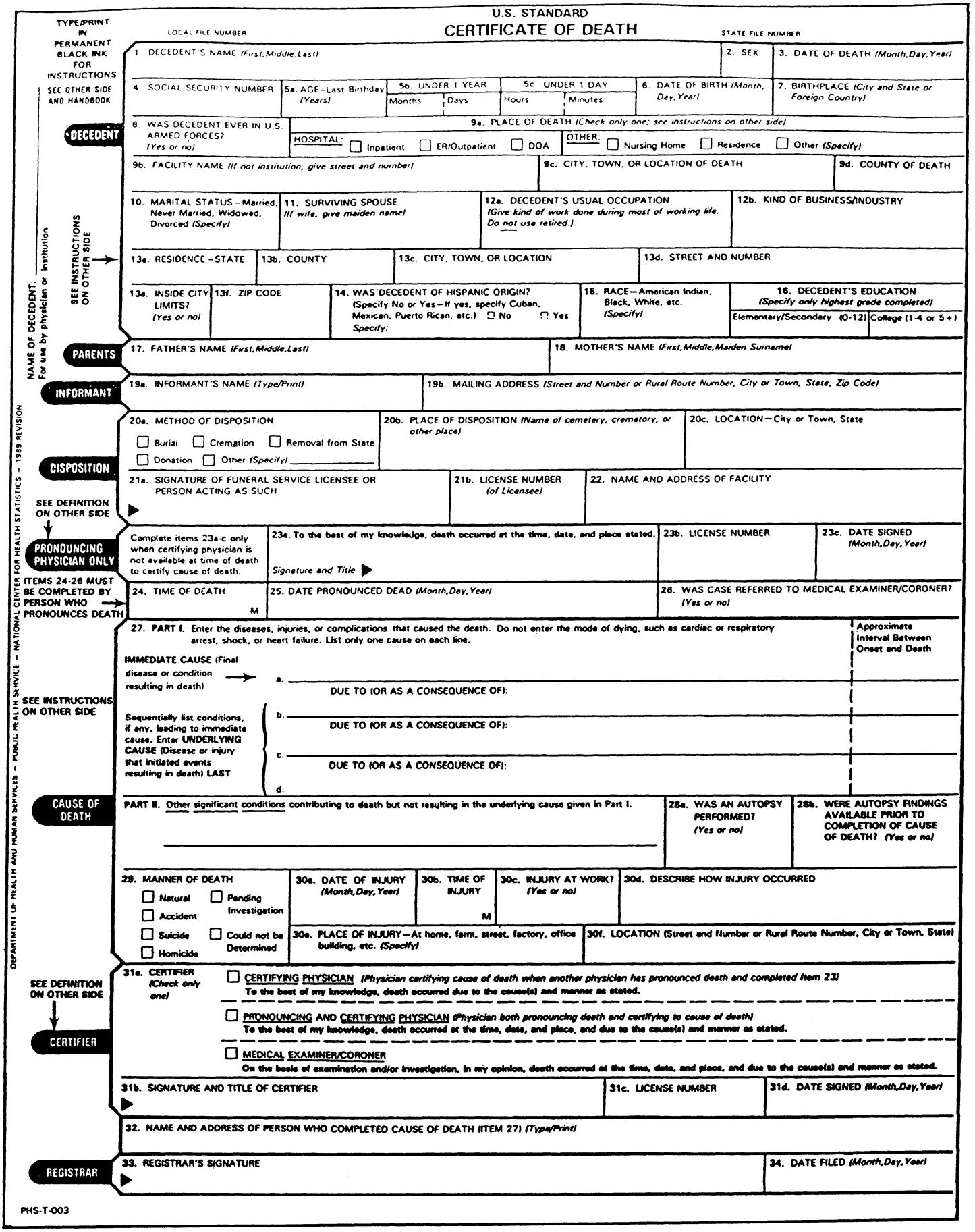
SYMBOLS USED IN TABLES

Data not available	---
Category not applicable	...
Quantity zero	–
Quantity more than 0 but less than 0.05	0.0
Figure does not meet standards of reliability or precision	*



U.S. STANDARD
CERTIFICATE OF DEATH

TYPE/PRINT IN PERMANENT BLACK INK FOR INSTRUCTIONS SEE OTHER SIDE AND HANDBOOK

LOCAL FILE NUMBER

STATE FILE NUMBER

NAME OF DECEDENT: For use by physician or institution

SEE INSTRUCTIONS ON OTHER SIDE

DECEDENT

1. DECEDENT'S NAME (First, Middle, Last)
2. SEX
3. DATE OF DEATH (Month, Day, Year)
4. SOCIAL SECURITY NUMBER
5a. AGE—Last Birthday (Years)
5b. UNDER 1 YEAR — Months / Days
5c. UNDER 1 DAY — Hours / Minutes
6. DATE OF BIRTH (Month, Day, Year)
7. BIRTHPLACE (City and State or Foreign Country)
8. WAS DECEDENT EVER IN U.S. ARMED FORCES? (Yes or no)
9a. PLACE OF DEATH (Check only one; see instructions on other side)
HOSPITAL: ☐ Inpatient ☐ ER/Outpatient ☐ DOA
OTHER: ☐ Nursing Home ☐ Residence ☐ Other (Specify)
9b. FACILITY NAME (If not institution, give street and number)
9c. CITY, TOWN, OR LOCATION OF DEATH
9d. COUNTY OF DEATH
10. MARITAL STATUS—Married, Never Married, Widowed, Divorced (Specify)
11. SURVIVING SPOUSE (If wife, give maiden name)
12a. DECEDENT'S USUAL OCCUPATION (Give kind of work done during most of working life. Do not use retired.)
12b. KIND OF BUSINESS/INDUSTRY
13a. RESIDENCE—STATE
13b. COUNTY
13c. CITY, TOWN, OR LOCATION
13d. STREET AND NUMBER
13e. INSIDE CITY LIMITS? (Yes or no)
13f. ZIP CODE
14. WAS DECEDENT OF HISPANIC ORIGIN? (Specify No or Yes—If yes, specify Cuban, Mexican, Puerto Rican, etc.) ☐ No ☐ Yes Specify:
15. RACE—American Indian, Black, White, etc. (Specify)
16. DECEDENT'S EDUCATION (Specify only highest grade completed)
Elementary/Secondary (0-12) / College (1-4 or 5+)

PARENTS

17. FATHER'S NAME (First, Middle, Last)
18. MOTHER'S NAME (First, Middle, Maiden Surname)

INFORMANT

19a. INFORMANT'S NAME (Type/Print)
19b. MAILING ADDRESS (Street and Number or Rural Route Number, City or Town, State, Zip Code)

DISPOSITION

20a. METHOD OF DISPOSITION
☐ Burial ☐ Cremation ☐ Removal from State
☐ Donation ☐ Other (Specify) _____
20b. PLACE OF DISPOSITION (Name of cemetery, crematory, or other place)
20c. LOCATION—City or Town, State
21a. SIGNATURE OF FUNERAL SERVICE LICENSEE OR PERSON ACTING AS SUCH
21b. LICENSE NUMBER (of Licensee)
22. NAME AND ADDRESS OF FACILITY

SEE DEFINITION ON OTHER SIDE

PRONOUNCING PHYSICIAN ONLY

Complete items 23a-c only when certifying physician is not available at time of death to certify cause of death.
23a. To the best of my knowledge, death occurred at the time, date, and place stated. Signature and Title
23b. LICENSE NUMBER
23c. DATE SIGNED (Month, Day, Year)

ITEMS 24-26 MUST BE COMPLETED BY PERSON WHO PRONOUNCES DEATH

24. TIME OF DEATH M
25. DATE PRONOUNCED DEAD (Month, Day, Year)
26. WAS CASE REFERRED TO MEDICAL EXAMINER/CORONER? (Yes or no)

CAUSE OF DEATH

27. PART I. Enter the diseases, injuries, or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock, or heart failure. List only one cause on each line.

Approximate Interval Between Onset and Death

IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. _____ DUE TO (OR AS A CONSEQUENCE OF):

SEE INSTRUCTIONS ON OTHER SIDE

Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE (Disease or injury that initiated events resulting in death) LAST

b. _____ DUE TO (OR AS A CONSEQUENCE OF):
c. _____ DUE TO (OR AS A CONSEQUENCE OF):
d. _____

PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in Part I.

28a. WAS AN AUTOPSY PERFORMED? (Yes or no)
28b. WERE AUTOPSY FINDINGS AVAILABLE PRIOR TO COMPLETION OF CAUSE OF DEATH? (Yes or no)

29. MANNER OF DEATH
☐ Natural ☐ Pending Investigation
☐ Accident
☐ Suicide ☐ Could not be Determined
☐ Homicide
30a. DATE OF INJURY (Month, Day, Year)
30b. TIME OF INJURY M
30c. INJURY AT WORK? (Yes or no)
30d. DESCRIBE HOW INJURY OCCURRED
30e. PLACE OF INJURY—At home, farm, street, factory, office building, etc. (Specify)
30f. LOCATION (Street and Number or Rural Route Number, City or Town, State)

SEE DEFINITION ON OTHER SIDE

CERTIFIER

31a. CERTIFIER (Check only one)

☐ CERTIFYING PHYSICIAN (Physician certifying cause of death when another physician has pronounced death and completed Item 23)
To the best of my knowledge, death occurred due to the cause(s) and manner as stated.

☐ PRONOUNCING AND CERTIFYING PHYSICIAN (Physician both pronouncing death and certifying to cause of death)
To the best of my knowledge, death occurred at the time, date, and place, and due to the cause(s) and manner as stated.

☐ MEDICAL EXAMINER/CORONER
On the basis of examination and/or investigation, in my opinion, death occurred at the time, date, and place, and due to the cause(s) and manner as stated.

31b. SIGNATURE AND TITLE OF CERTIFIER
31c. LICENSE NUMBER
31d. DATE SIGNED (Month, Day, Year)

32. NAME AND ADDRESS OF PERSON WHO COMPLETED CAUSE OF DEATH (ITEM 27) (Type/Print)

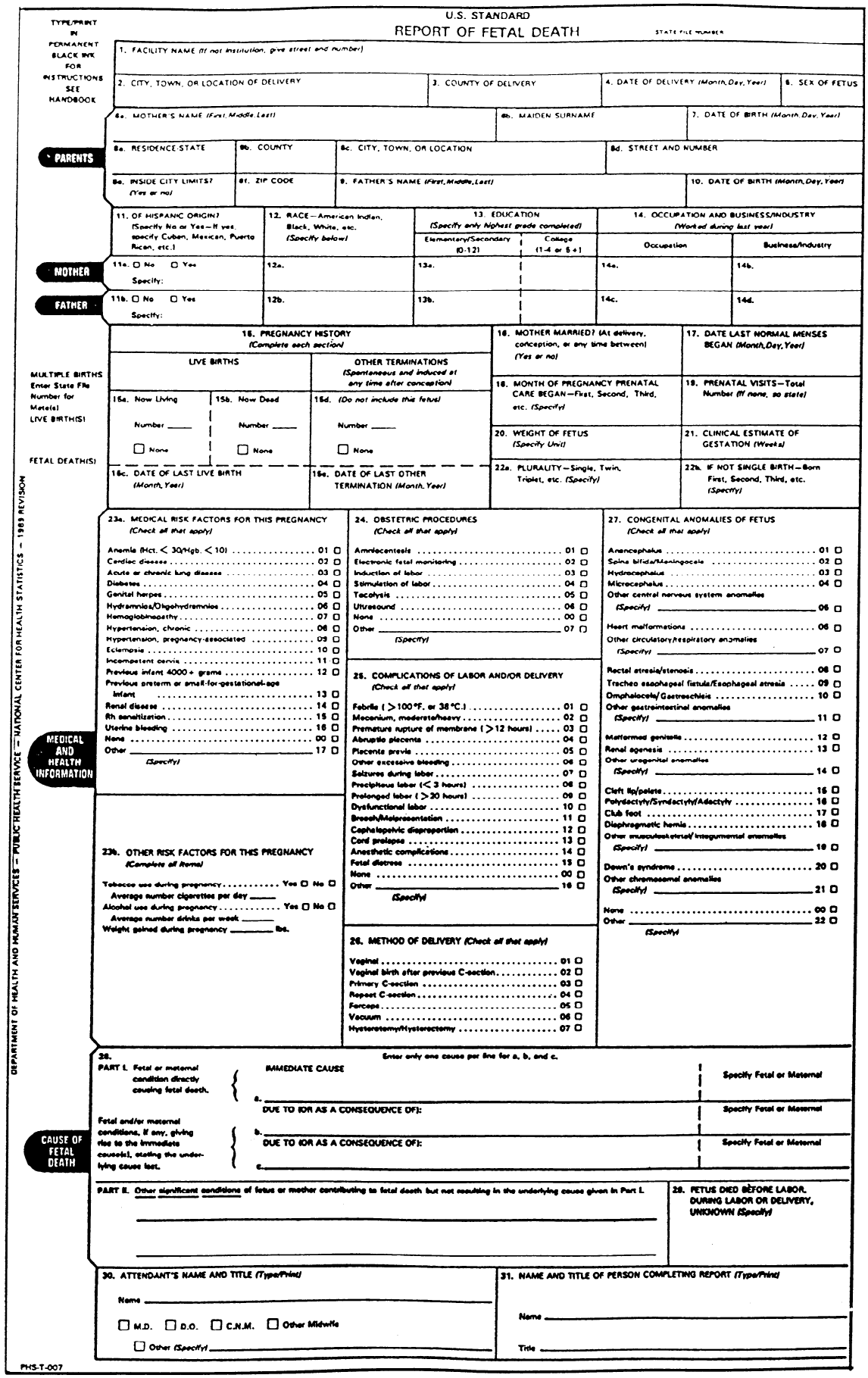
REGISTRAR

33. REGISTRAR'S SIGNATURE
34. DATE FILED (Month, Day, Year)

DEPARTMENT OF HEALTH AND HUMAN SERVICES – PUBLIC HEALTH SERVICE – NATIONAL CENTER FOR HEALTH STATISTICS – 1989 REVISION

PHS-T-003

Figure 7-A. U.S. Standard Certificate of Death



U.S. STANDARD
REPORT OF FETAL DEATH

TYPE/PRINT IN PERMANENT BLACK INK FOR INSTRUCTIONS SEE HANDBOOK

STATE FILE NUMBER

1. FACILITY NAME (If not institution, give street and number)

2. CITY, TOWN, OR LOCATION OF DELIVERY | 3. COUNTY OF DELIVERY | 4. DATE OF DELIVERY (Month, Day, Year) | 5. SEX OF FETUS

PARENTS

6a. MOTHER'S NAME (First, Middle, Last) | 6b. MAIDEN SURNAME | 7. DATE OF BIRTH (Month, Day, Year)

8a. RESIDENCE-STATE | 8b. COUNTY | 8c. CITY, TOWN, OR LOCATION | 8d. STREET AND NUMBER

8e. INSIDE CITY LIMITS? (Yes or no) | 8f. ZIP CODE | 9. FATHER'S NAME (First, Middle, Last) | 10. DATE OF BIRTH (Month, Day, Year)

	11. OF HISPANIC ORIGIN? (Specify No or Yes—If yes, specify Cuban, Mexican, Puerto Rican, etc.)	12. RACE—American Indian, Black, White, etc. (Specify below)	13. EDUCATION (Specify only highest grade completed)		14. OCCUPATION AND BUSINESS/INDUSTRY (Worked during last year)	
			Elementary/Secondary (0-12)	College (1-4 or 5+)	Occupation	Business/Industry
MOTHER	11a. ☐ No ☐ Yes Specify:	12a.	13a.		14a.	14b.
FATHER	11b. ☐ No ☐ Yes Specify:	12b.	13b.		14c.	14d.

MULTIPLE BIRTHS Enter State File Number for Mate(s)

LIVE BIRTH(S)

FETAL DEATH(S)

15. PREGNANCY HISTORY (Complete each section)			16. MOTHER MARRIED? (At delivery, conception, or any time between) (Yes or no)	17. DATE LAST NORMAL MENSES BEGAN (Month, Day, Year)
LIVE BIRTHS		OTHER TERMINATIONS (Spontaneous and induced at any time after conception)		
15a. Now Living Number ____ ☐ None	15b. Now Dead Number ____ ☐ None	15d. (Do not include this fetus) Number ____ ☐ None	18. MONTH OF PREGNANCY PRENATAL CARE BEGAN—First, Second, Third, etc. (Specify)	19. PRENATAL VISITS—Total Number (If none, so state)
			20. WEIGHT OF FETUS (Specify Unit)	21. CLINICAL ESTIMATE OF GESTATION (Weeks)
15c. DATE OF LAST LIVE BIRTH (Month, Year)		15e. DATE OF LAST OTHER TERMINATION (Month, Year)	22a. PLURALITY—Single, Twin, Triplet, etc. (Specify)	22b. IF NOT SINGLE BIRTH—Born First, Second, Third, etc. (Specify)

MEDICAL AND HEALTH INFORMATION

23a. MEDICAL RISK FACTORS FOR THIS PREGNANCY (Check all that apply)

Anemia (Hct. < 30/Hgb. < 10) ..... 01 ☐
Cardiac disease ..... 02 ☐
Acute or chronic lung disease ..... 03 ☐
Diabetes ..... 04 ☐
Genital herpes ..... 05 ☐
Hydramnios/Oligohydramnios ..... 06 ☐
Hemoglobinopathy ..... 07 ☐
Hypertension, chronic ..... 08 ☐
Hypertension, pregnancy-associated ..... 09 ☐
Eclampsia ..... 10 ☐
Incompetent cervix ..... 11 ☐
Previous infant 4000+ grams ..... 12 ☐
Previous preterm or small-for-gestational-age infant ..... 13 ☐
Renal disease ..... 14 ☐
Rh sensitization ..... 15 ☐
Uterine bleeding ..... 16 ☐
None ..... 00 ☐
Other _____ (Specify) 17 ☐

23b. OTHER RISK FACTORS FOR THIS PREGNANCY (Complete all items)

Tobacco use during pregnancy ..... Yes ☐ No ☐
Average number cigarettes per day ____
Alcohol use during pregnancy ..... Yes ☐ No ☐
Average number drinks per week ____
Weight gained during pregnancy ____ lbs.

24. OBSTETRIC PROCEDURES (Check all that apply)

Amniocentesis ..... 01 ☐
Electronic fetal monitoring ..... 02 ☐
Induction of labor ..... 03 ☐
Stimulation of labor ..... 04 ☐
Tocolysis ..... 05 ☐
Ultrasound ..... 06 ☐
None ..... 00 ☐
Other _____ (Specify) 07 ☐

25. COMPLICATIONS OF LABOR AND/OR DELIVERY (Check all that apply)

Febrile (>100°F. or 38°C.) ..... 01 ☐
Meconium, moderate/heavy ..... 02 ☐
Premature rupture of membrane (>12 hours) ..... 03 ☐
Abruptio placenta ..... 04 ☐
Placenta previa ..... 05 ☐
Other excessive bleeding ..... 06 ☐
Seizures during labor ..... 07 ☐
Precipitous labor (<3 hours) ..... 08 ☐
Prolonged labor (>20 hours) ..... 09 ☐
Dysfunctional labor ..... 10 ☐
Breech/Malpresentation ..... 11 ☐
Cephalopelvic disproportion ..... 12 ☐
Cord prolapse ..... 13 ☐
Anesthetic complications ..... 14 ☐
Fetal distress ..... 15 ☐
None ..... 00 ☐
Other _____ (Specify) 16 ☐

26. METHOD OF DELIVERY (Check all that apply)

Vaginal ..... 01 ☐
Vaginal birth after previous C-section ..... 02 ☐
Primary C-section ..... 03 ☐
Repeat C-section ..... 04 ☐
Forceps ..... 05 ☐
Vacuum ..... 06 ☐
Hysterotomy/Hysterectomy ..... 07 ☐

27. CONGENITAL ANOMALIES OF FETUS (Check all that apply)

Anencephalus ..... 01 ☐
Spina bifida/Meningocele ..... 02 ☐
Hydrocephalus ..... 03 ☐
Microcephalus ..... 04 ☐
Other central nervous system anomalies (Specify) _____ 05 ☐
Heart malformations ..... 06 ☐
Other circulatory/respiratory anomalies (Specify) _____ 07 ☐
Rectal atresia/stenosis ..... 08 ☐
Tracheo esophageal fistula/Esophageal atresia ..... 09 ☐
Omphalocele/Gastroschisis ..... 10 ☐
Other gastrointestinal anomalies (Specify) _____ 11 ☐
Malformed genitalia ..... 12 ☐
Renal agenesis ..... 13 ☐
Other urogenital anomalies (Specify) _____ 14 ☐
Cleft lip/palate ..... 15 ☐
Polydactyly/Syndactyly/Adactyly ..... 16 ☐
Club foot ..... 17 ☐
Diaphragmatic hernia ..... 18 ☐
Other musculoskeletal/integumental anomalies (Specify) _____ 19 ☐
Down's syndrome ..... 20 ☐
Other chromosomal anomalies (Specify) _____ 21 ☐
None ..... 00 ☐
Other _____ (Specify) 22 ☐

CAUSE OF FETAL DEATH

28. Enter only one cause per line for a, b, and c.

PART I. Fetal or maternal condition directly causing fetal death.
a. IMMEDIATE CAUSE — Specify Fetal or Maternal

Fetal and/or maternal conditions, if any, giving rise to the immediate cause(s), stating the underlying cause last.
b. DUE TO (OR AS A CONSEQUENCE OF): — Specify Fetal or Maternal
c. DUE TO (OR AS A CONSEQUENCE OF): — Specify Fetal or Maternal

PART II. Other significant conditions of fetus or mother contributing to fetal death but not resulting in the underlying cause given in Part I.

29. FETUS DIED BEFORE LABOR, DURING LABOR OR DELIVERY, UNKNOWN (Specify)

30. ATTENDANT'S NAME AND TITLE (Type/Print)
Name
☐ M.D. ☐ D.O. ☐ C.N.M. ☐ Other Midwife
☐ Other (Specify)

31. NAME AND TITLE OF PERSON COMPLETING REPORT (Type/Print)
Name
Title

DEPARTMENT OF HEALTH AND HUMAN SERVICES — PUBLIC HEALTH SERVICE — NATIONAL CENTER FOR HEALTH STATISTICS — 1989 REVISION

PHS-T-007

Figure 7-B. U.S. Standard Report of Fetal Death

Table A. Comparison of percent agreement and ratio of deaths for census or survey record to deaths by race for matching death certificate: 1960 and 1979-85

Race	Census		NLMS[1]	
	Percent agreement	Ratio census/ death certificate	Percent agreement	Ratio NLMS/ death certificate
White.....	99.8	1.00	99.2	1.00
Black.....	98.2	1.00	98.2	1.00
American Indian.....	79.2	1.12	73.6	1.22
Asian.....	---	...	82.4	1.12
Japanese.....	97.0	1.04	...	...
Chinese	90.3	1.07	...	...
Filipino	72.6	1.28	...	...

--- Data not available.

... Category not applicable.

[1] NLMS is defined as National Longitudinal Mortality Study.

SOURCES: Hambright TZ. Comparability of marital status, race, nativity, and country of origin on the death certificate and matching census record: U.S., May-August 1960. National Center for Health Statistics. Vital Health Stat 2(34). 1969; Sorlie PD, Rogot E, Johnson NJ. Validity of demographic characteristics on the death certificate. Epidemiology 3(2):181-4. 1992.

Table B. Infant mortality rates by race of mother from linked and unlinked data, 1989-91; and ratio of linked to unlinked rates: United States

[Rates per 1,000 live births in specified group]

Race	Unlinked period rate 1989-91	Linked birth cohort rate 1989-91	Ratio linked/ unlinked rates
All races	9.3	9.0	0.97
White	7.6	7.4	0.97
Black	18.0	17.1	0.95
American Indian	11.2	12.6	1.13
Chinese	5.0	5.1	1.02
Japanese	4.4	5.3	1.20
Hawaiian	10.9	9.0	0.83
Filipino	4.1	6.4	1.56
Other Asian or Pacific Islander	5.6	7.0	1.25

NOTE: Births for race not stated are not distributed.

Table C. Period of gestation at which fetal-death reporting is required: Each reporting area, 1994

Area	All periods of gestation	16 weeks	20 weeks	20 weeks or 350 grams	20 weeks or 400 grams	20 weeks or 500 grams	5 months	350 grams	500 grams
Alabama			X						
Alaska			X						
Arizona				X					
Arkansas	X[1]								
California			X						
Colorado	X[1]								
Connecticut			X						
Delaware								X[2]	
District of Columbia						X			
Florida			X						
Georgia	X								
Hawaii	X								
Idaho				X					
Illinois			X						
Indiana			X						
Iowa			X						
Kansas								X	
Kentucky				X					
Louisiana				X					
Maine			X						
Maryland			X[3]						
Massachusetts				X					
Michigan					X				
Minnesota			X						
Mississippi				X					
Missouri				X					
Montana						X			
Nebraska			X						
Nevada			X						
New Hampshire				X					
New Jersey			X						
New Mexico									X
New York									
New York excluding New York City	X								
New York City	X								
North Carolina			X						
North Dakota			X						
Ohio			X						
Oklahoma			X						

Table C. Period of gestation at which fetal-death reporting is required: Each reporting area, 1994

Area	All periods of gestation	16 weeks	20 weeks	20 weeks or 350 grams	20 weeks or 400 grams	20 weeks or 500 grams	5 months	350 grams	500 grams
Oregon			X						
Pennsylvania		X							
Rhode Island	X								
South Carolina				X					
South Dakota									X
Tennessee									X[4]
Texas			X						
Utah			X						
Vermont			X[5]						
Virginia	X								
Washington			X						
West Virginia			X						
Wisconsin				X					
Wyoming			X						
Puerto Rico							X		
Virgin Islands	X								
Guam			X						

[1]Although State law requires the reporting of fetal deaths of all periods of gestation, only data for fetal deaths of 20 weeks of gestation or more are provided to NCHS.

[2]If weight is unknown, 20 completed weeks of gestation or more.

[3]If gestational age is unknown, weight of 500 grams or more.

[4]If weight is unknown, 22 completed weeks of gestation or more.

[5]If gestational age is unknown, weight of 400 grams or more, 15 ounces or more.

Table D. Percent of fetal death records on which specified items were not stated: Each State, 1994

[By place of occurrence. Records include only those with stated or presumed period of gestation of 20 weeks or more]

Area	Length of gestation[1]	Marital status	Place of delivery	Birth-weight	Month prenatal care began	Number of prenatal visits	Hispanic origin of mother	Mother's educational attainment	Medical risk factors[2]	Tobacco use	Alcohol use	Obstetric procedures	Complications of labor and/or delivery[3]	Congenital anomalies
Alabama	0.9	0.7	-	4.4	7.7	8.3	0.2	6.3	1.6	3.2	3.2	1.1	2.5	2.5
Alaska	2.4	2.4	-	4.8	2.4	4.8	2.4	11.9	-	4.8	2.4	-	-	2.4
Arizona	2.0	0.9	-	5.9	8.9	12.3	2.7	11.6	3.2	9.1	9.5	3.4	2.7	3.4
Arkansas	0.4	-	-	2.6	15.7	17.0	0.4	9.6	0.9	3.9	3.5	0.9	0.4	0.9
California	10.8	---	-	1.3	6.4	7.0	1.6	6.5	2.6	---	---	2.6	2.3	4.2
Colorado	-	1.1	-	17.0	17.6	21.4	-	17.6	-	19.7	20.8	-	-	-
Connecticut	4.9	---	-	14.0	48.2	49.5	22.5	76.2	34.9	37.5	39.4	31.3	33.9	54.4
Delaware	-	-	-	7.7	-	1.9	-	3.8	13.5	11.5	11.5	11.5	13.5	11.5
District of Columbia	4.1	11.2	0.6	11.2	22.5	23.1	4.7	30.8	37.3	58.6	59.2	39.1	41.4	52.7
Florida	3.0	3.8	-	8.8	14.5	15.6	2.8	10.2	5.3	6.7	7.6	4.2	4.9	5.3
Georgia	0.9	0.3	-	16.8	17.7	19.0	8.8	30.7	5.2	6.9	7.6	1.7	2.7	3.0
Hawaii	0.7	-	-	33.1	34.5	32.4	17.3	38.8	---	---	---	---	---	---
Idaho	-	-	1.1	4.5	4.5	3.4	2.3	8.0	5.7	8.0	9.1	4.5	4.5	15.9
Illinois	3.9	5.8	0.1	6.7	14.7	15.6	4.8	8.8	15.2	2.4	1.6	12.2	16.2	18.9
Indiana	1.3	1.5	0.2	12.5	9.6	13.8	5.9	9.2	7.2	---	15.3	5.7	4.8	7.0
Iowa	2.4	0.9	-	4.7	1.9	4.2	-	2.4	0.9	1.4	1.9	0.5	0.5	1.9
Kansas	2.2	0.4	0.4	-	3.5	4.8	1.3	3.1	10.1	14.1	10.1	8.8	8.8	18.1
Kentucky	0.8	0.5	-	1.1	0.8	3.2	0.5	2.7	23.6	18.0	18.8	18.6	23.6	38.2
Louisiana	23.0	0.7	-	5.4	11.9	14.7	---	13.4	---	---	---	---	---	---
Maine	21.1	21.1	-	31.6	-	22.8	28.1	24.6	17.5	19.3	21.1	15.8	17.5	17.5
Maryland	42.6	---	1.0	34.7	37.0	---	---	34.5	---	---	---	---	---	---
Massachusetts	0.2	-	0.4	1.8	1.6	2.2	---	22.4	---	---	---	---	---	---
Michigan	0.7	---	0.6	2.2	8.8	11.5	16.0	13.2	3.5	8.3	9.7	2.6	3.2	3.6
Minnesota	0.8	14.9	-	5.8	2.7	7.4	3.7	10.3	11.1	11.7	15.4	7.7	13.3	13.5
Mississippi	1.4	-	0.2	2.3	7.8	11.8	-	6.4	3.9	6.4	6.6	1.6	2.5	3.1
Missouri	1.1	-	-	4.8	9.3	8.8	1.4	9.1	1.6	2.9	3.6	1.1	2.0	1.6
Montana	-	-	-	4.0	6.0	4.0	10.0	10.0	2.0	4.0	4.0	0.0	2.0	0.0
Nebraska	-	0.7	-	4.2	2.8	1.4	4.9	2.1	1.4	2.1	2.1	0.7	0.7	0.7
Nevada	3.5	---	-	29.2	28.5	31.9	5.6	10.4	40.3	46.5	47.9	25.7	34.7	41.0
New Hampshire	-	-	-	2.5	2.5	3.8	23.8	11.2	-	1.2	1.2	1.2	0.0	0.0
New Jersey	9.2	3.4	0.3	21.4	18.0	21.0	2.3	20.9	7.1	7.5	8.9	5.6	7.8	8.6
New Mexico	-	2.8	-	6.5	12.1	7.5	-	38.3	4.7	2.8	2.8	0.9	0.9	---
New York State	1.9	---	0.1	34.7	25.5	27.5	11.8	38.6	-	---	16.1	-	15.7	-
New York City	2.8	---	-	25.5	47.0	35.6	16.8	38.4	19.6	22.0	24.2	18.7	22.2	---
North Carolina	2.0	0.8	-	6.1	4.6	6.9	1.3	5.0	1.4	3.9	4.0	1.4	1.6	2.1
North Dakota	4.9	-	-	8.2	3.3	8.2	8.2	3.3	6.6	8.2	11.5	3.3	3.3	3.3
Ohio	0.7	32.0	0.1	11.2	11.9	15.4	2.9	8.2	9.7	11.0	13.2	9.0	10.2	10.4

Table D. Percent of fetal death records on which specified items were not stated: Each State, 1994

[By place of occurrence. Records include only those with stated or presumed period of gestation of 20 weeks or more]

Area	Length of gestation[1]	Marital status	Place of delivery	Birth-weight	Month prenatal care began	Number of prenatal visits	Hispanic origin of mother	Mother's educational attainment	Medical risk factors[2]	Tobacco use	Alcohol use	Obstetric procedures	Complications of labor and/or delivery[3]	Congenital anomalies
Oklahoma	53.3	25.7	0.6	32.0	48.5	49.1	---	43.7	---	---	---	---	---	---
Oregon	-	-	-	3.3	1.7	1.7	1.2	7.9	-	1.2	1.2	-	-	-
Pennsylvania	2.1	2.1	0.1	10.4	14.0	15.3	1.3	16.8	2.9	7.1	8.6	2.0	2.8	6.8
Rhode Island	2.5	82.7	-	19.8	98.8	98.8	96.3	97.5	70.4	84.0	84.0	67.9	69.1	81.5
South Carolina	0.4	1.1	-	2.6	2.8	3.0	0.8	8.9	0.8	2.1	2.1	0.6	0.9	1.3
South Dakota	4.3	-	-	2.1	2.1	2.1	-	2.1	-	---	---	-	-	-
Tennessee	0.2	0.2	-	0.7	8.2	12.9	2.2	8.0	2.5	5.7	6.0	2.7	4.2	5.0
Texas	4.1	---	-	11.2	11.9	12.6	0.3	11.4	12.5	10.2	11.5	2.1	5.4	5.5
Utah	-	0.9	-	6.6	5.2	4.7	0.9	7.1	3.3	3.8	3.8	0.5	2.8	17.9
Vermont	-	-	-	14.8	14.8	14.8	-	3.7	3.7	-	3.7	-	-	3.7
Virginia	1.1	0.9	-	28.7	21.9	26.6	7.3	35.9	26.1	28.6	29.6	23.7	29.7	34.7
Washington	3.1	2.2	0.2	17.3	15.1	16.3	15.1	21.1	3.1	6.2	10.8	3.4	3.4	4.3
West Virginia	-	1.3	-	2.5	8.8	8.2	1.3	7.5	-	8.2	9.4	-	-	-
Wisconsin	-	-	-	0.5	0.7	0.2	0.2	0.9	-	0.5	0.5	0.2	0.2	0.2
Wyoming	-	-	-	3.3	3.3	-	-	3.3	3.3	-	3.3	3.3	-	6.7

- Quantity zero.

--- Data not available.

[1] California, Louisiana, Maryland, and Oklahoma report date last normal menses began but do not report clinical estimate of gestation.

[2] Kansas and South Dakota do not report Rh sensitization; New York State does not report previous infant 4,000 grams or more; Texas does not report genital herpes and uterine bleeding.

[3] Texas does not report cephalopelvic disproportion, anesthetic complications, and fetal distress.

Table E. Numbers of deaths and ratios of deaths for selected causes as tabulated by State of occurrence and NCHS, 1994

[Data by place of occurrence include deaths of nonresidents. Numbers after causes of death are category numbers of the Ninth Revision, International Classification of Diseases, 1975]

Causes	Alaska	NCHS	Ratio AK/NCHS
All causes	2,446	2,472	0.99
Symptoms, signs, and ill-defined conditions 780-799	47	59	0.80
Accidents and adverse effects E800-E949	308	380	0.81
Motor vehicle accidents E810-E825	91	91	1.00
All other accidents and adverse effects E800-E807,E826-E949	217	289	0.75
Suicide E950-E959	146	120	1.22
Homicide and legal intervention E960-E978	45	38	1.18
All other external causes E980-E999	8	5	1.60

Table F. Population of Birth- and Death-Registration States, 1900-1932, and United States, 1933-1994

[Population enumerated as of April 1 for 1940, 1950, 1960, 1970, 1980, and 1990 and estimated as of July 1 for all other years]

Year	United States [1]		Year	United States [1]		Birth-registration States		Death-registration States	
	Population including Armed Forces abroad	Population residing in area		Population including Armed Forces abroad	Population residing in area	Number of States [2]	Population residing in area	Number of States [2]	Population residing in area
1994	260,650,842	260,340,990							
1993	258,119,768	257,783,004	1946	141,389,000	140,054,000	...	...	...	...
1992	255,457,501	255,077,536	1945	139,928,000	132,481,000	...	...	...	...
1991	252,688,000	252,177,000	1944	138,397,000	132,885,000	...	...	...	...
1990	249,225,000	248,709,873	1943	136,739,000	134,245,000	...	...	...	...
1989	247,342,000	246,819,000	1942	134,860,000	133,920,000	...	...	...	...
1988	245,021,000	244,499,000	1941	133,402,000	133,121,000	...	...	...	...
1987	242,804,000	242,289,000	1940	131,820,000	131,669,275	...	...	...	...
1986	240,651,000	240,133,000	1939	131,028,000	130,879,718	...	...	...	...
1985	238,466,000	237,924,000	1938	129,969,000	129,824,939	...	...	...	...
1984	236,348,000	235,825,000	1937	128,961,000	128,824,829	...	...	...	...
1983	234,307,000	233,792,000	1936	128,181,000	128,053,180	...	...	...	...
1982	232,188,000	231,664,000	1935	127,362,000	127,250,232	...	...	...	...
1981	229,966,000	229,466,000	1934	126,485,000	126,373,773	...	...	...	...
1980	227,061,000	226,545,805	1933	125,690,000	125,578,763	...	...	...	...
1979	225,055,000	224,567,000	1932	124,949,000	124,840,471	47	118,903,899	47	118,903,899
1978	222,585,000	222,095,000	1931	124,149,000	124,039,648	46	117,455,229	47	118,148,987
1977	220,239,000	219,760,000	1930	123,188,000	123,076,741	46	116,544,946	47	117,238,278
1976	218,035,000	217,563,000	1929	---	121,769,939	46	115,317,450	46	115,317,450
1975	215,973,000	215,465,000	1928	---	120,501,115	44	113,636,160	44	113,636,160
1974	213,854,000	213,342,000	1927	---	119,038,062	40	104,320,830	42	107,084,532
1973	211,909,000	211,357,000	1926	---	117,399,225	35	90,400,590	41	103,822,683
1972	209,896,000	209,284,000	1925	---	115,831,963	33	88,294,564	40	102,031,555
1971	207,661,000	206,827,000	1924	---	114,113,463	33	87,000,295	39	99,318,098
1970	204,270,000	203,211,926	1923	---	111,949,945	30	81,072,123	38	96,788,197
1969	202,677,000	201,385,000	1922	---	110,054,778	30	79,560,746	37	92,702,901
1968	200,706,000	199,399,000	1921	---	108,541,489	27	70,807,090	34	87,814,447
1967	198,712,000	197,457,000	1920	---	106,466,420	23	63,597,307	34	86,079,263
1966	196,560,000	195,576,000	1919	105,063,000	104,512,110	22	61,212,076	33	83,157,982
1965	194,303,000	193,526,000	1918	104,550,000	103,202,801	20	55,153,782	30	79,008,412
1964	191,889,000	191,141,000	1917	103,414,000	103,265,913	20	55,197,952	27	70,234,775
1963	189,242,000	188,483,000	1916	---	101,965,984	11	32,944,013	26	66,971,177
1962	186,538,000	185,771,000	1915	---	100,549,013	10	31,096,697	24	61,894,847
1961	183,691,000	182,992,000	1914	---	99,117,567	...	...	24	60,963,309
1960	179,933,000	179,323,175	1913	---	97,226,814	...	...	23	58,156,740
1959	177,264,000	176,513,000	1912	---	95,331,300	...	...	22	54,847,700
1958	174,141,000	173,320,000	1911	---	93,867,814	...	...	22	53,929,644
1957	171,274,000	170,371,000	1910	---	92,406,536	...	...	20	47,470,437
1956	168,221,000	167,306,000	1909	---	90,491,525	...	...	18	44,223,513
1955	165,275,000	164,308,000	1908	---	88,708,976	...	...	17	38,634,759
1954	162,391,000	161,164,000	1907	---	87,000,271	...	...	15	34,552,837
1953	159,565,000	158,242,000	1906	---	85,436,556	...	...	15	33,782,288
1952	156,954,000	155,687,000	1905	---	83,819,666	...	...	10	21,767,980
1951	154,287,000	153,310,000	1904	---	82,164,974	...	...	10	21,332,076
1950	151,132,000	150,697,361	1903	---	80,632,152	...	...	10	20,943,222
1949	149,188,000	148,665,000	1902	---	79,160,196	...	...	10	20,582,907
1948	146,631,000	146,093,000	1901	---	77,585,128	...	...	10	20,237,453
1947	144,126,000	143,446,000	1900	---	76,094,134	...	...	10	19,965,446

[1] Alaska included beginning 1959 and Hawaii, 1960.
[2] The District of Columbia is not included in "Number of States," but it is represented in all data shown for each year.

SOURCE: Published and unpublished data from the U.S. Bureau of the Census; see text.

Table G. Source for resident population and population including Armed Forces abroad: Birth- and death-registration States, 1900-32, and United States, 1933-94

Year	Source
1994	U.S. Bureau of the Census, Electronic Data File, RESD0794, and unpublished data.
1993	U.S. Bureau of the Census, Electronic Data File, RESP0793, and unpublished data.
1992	U.S. Bureau of the Census, Electronic Data File, RESP0792, and unpublished data.
1991	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 1095, 1993.
1990	U.S. Bureau of the Census, Unpublished data from the 1990 census, 1990 CPH-L-74 and unpublished data consistent with *Current Population Reports*, Series P-25, No. 1095.
1981-89 . . .	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 1095, 1993.
1980	U.S. Bureau of the Census, *U.S. Census of Population: 1980, Number of Inhabitants*, PC-80-1A1, United States Summary, 1983.
1971-79 . . .	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 917, July 1982.
1970	U.S. Bureau of the Census, *U.S. Census of Population: 1970, Number of Inhabitants*, Final Report PC(1)-A1, United States Summary, 1971.
1961-69 . . .	U.S. Bureau of the Census, Current Population *Reports*, Series P-25, No. 519, April 1974.
1960	U.S. Bureau of the Census, *U.S. Census of Population: 1960, Number of Inhabitants*, PC(1)-A1, United States Summary, 1964.
1951-59 . . .	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 310, June 30, 1965.
1940-50 . . .	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 499, May 1973.
1930-39 . . .	U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 499, May 1973,
1930	and National Office of Vital Statistics, *Vital Statistics Rates in the United States*, 1900-1940, 1947.
1920-29 . . .	National Office of Vital Statistics, *Vital Statistics Rates in the United States*, 1900-1940, 1947.
1917-19 . . .	Same as for 1930-39.
1900-16 . . .	Same as for 1920-29.

Table H. Estimated Population of the United States, by 5-Year Age Groups, Race, and Sex: July 1, 1994

[Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Age	All races			White			All other					
							Total			Black		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	260,340,990	127,076,429	133,264,561	216,469,961	106,138,931	110,331,030	43,871,029	20,937,498	22,933,531	32,672,217	15,491,454	17,180,763
Under 1 year	3,870,185	1,980,754	1,889,431	3,041,063	1,559,695	1,481,368	829,122	421,059	408,063	618,864	313,961	304,903
1-4 years	15,856,964	8,113,681	7,743,283	12,550,842	6,434,998	6,115,844	3,306,122	1,678,683	1,627,439	2,499,743	1,267,070	1,232,673
5-9 years	18,858,601	9,657,111	9,201,490	14,996,992	7,695,193	7,301,799	3,861,609	1,961,918	1,899,691	2,938,728	1,490,611	1,448,117
10-14 years	18,752,722	9,602,417	9,150,305	14,921,052	7,660,715	7,260,337	3,831,670	1,941,702	1,889,968	2,863,539	1,451,593	1,411,946
15-19 years	17,616,398	9,036,127	8,580,271	14,035,447	7,221,620	6,813,827	3,580,951	1,814,507	1,766,444	2,733,243	1,384,651	1,348,592
20-24 years	18,326,487	9,311,333	9,015,154	14,722,038	7,526,853	7,195,185	3,604,449	1,784,480	1,819,969	2,667,909	1,312,684	1,355,225
25-29 years	19,176,882	9,618,804	9,558,078	15,593,101	7,894,278	7,698,823	3,583,781	1,724,526	1,859,255	2,618,942	1,250,103	1,368,839
30-34 years	22,177,231	11,057,956	11,119,275	18,292,421	9,218,027	9,074,394	3,884,810	1,839,929	2,044,881	2,836,592	1,329,836	1,506,756
35-39 years	21,960,620	10,920,180	11,040,440	18,237,462	9,165,149	9,072,313	3,723,158	1,755,031	1,968,127	2,733,291	1,279,845	1,453,446
40-44 years	19,698,738	9,728,390	9,970,348	16,516,349	8,250,188	8,266,161	3,182,389	1,478,202	1,704,187	2,308,036	1,069,224	1,238,812
45-49 years	16,679,272	8,180,810	8,498,462	14,248,637	7,063,917	7,184,720	2,430,635	1,116,893	1,313,742	1,739,645	793,262	946,383
50-54 years	13,191,287	6,410,309	6,780,978	11,354,553	5,572,327	5,782,226	1,836,734	837,982	998,752	1,339,715	602,088	737,627
55-59 years	10,935,600	5,243,920	5,691,680	9,436,286	4,573,463	4,862,823	1,499,314	670,457	828,857	1,110,390	487,162	623,228
60-64 years	10,081,994	4,739,572	5,342,422	8,772,602	4,172,030	4,600,572	1,309,392	567,542	741,850	984,064	423,640	560,424
65-69 years	9,970,437	4,499,772	5,470,665	8,791,670	3,998,114	4,793,556	1,178,767	501,658	677,109	905,759	386,145	519,614
70-74 years	8,741,229	3,789,886	4,951,343	7,839,769	3,420,459	4,419,310	901,460	369,427	532,033	693,810	278,611	415,199
75-79 years	6,574,030	2,655,470	3,918,560	5,948,708	2,414,395	3,534,313	625,322	241,075	384,247	499,085	187,827	311,258
80-84 years	4,350,701	1,550,082	2,800,619	3,961,954	1,412,147	2,549,807	388,747	137,935	250,812	316,282	106,765	209,517
85 years and over	3,521,612	979,855	2,541,757	3,209,015	885,363	2,323,652	312,597	94,492	218,105	264,580	76,376	188,204

SOURCE: Published and unpublished data from the U.S. Bureau of the Census; see text.

Table I. Estimated Population, by Age, for the United States, Each Division and State, Puerto Rico, Virgin Islands, and Guam: July 1, 1994

[Figures include Armed Forces stationed in each area, and exclude Armed Forces stationed outside the United States]

Division and State	Total	Under 5 years	5-19 years	20-44 years	45-64 years	65 years and over
United States	260,340,990	19,727,149	55,227,721	101,339,958	50,888,153	33,158,009
Geographic divisions:						
New England	13,270,369	920,863	2,582,666	5,301,138	2,617,594	1,848,108
Middle Atlantic	38,125,343	2,760,074	7,523,908	14,644,656	7,806,890	5,389,815
East North Central	43,183,850	3,157,071	9,300,374	16,627,550	8,529,300	5,569,555
West North Central	18,210,216	1,287,111	4,070,216	6,806,616	3,508,486	2,537,787
South Atlantic	46,398,204	3,344,692	9,291,465	18,129,816	9,300,566	6,331,665
East South Central	15,889,937	1,135,448	3,430,520	6,055,830	3,236,546	2,031,593
West South Central	28,404,010	2,306,187	6,592,767	10,967,745	5,370,518	3,166,793
Mountain	15,214,246	1,228,990	3,576,587	5,790,142	2,892,512	1,726,015
Pacific	41,644,815	3,586,713	8,859,218	17,016,465	7,625,741	4,556,678
New England:						
Maine	1,240,209	77,670	260,458	476,002	253,379	172,700
New Hampshire	1,136,820	80,055	237,985	466,407	216,620	135,753
Vermont	580,209	37,983	122,410	232,159	117,172	70,485
Massachusetts	6,041,123	422,674	1,138,566	2,458,457	1,172,152	849,274
Rhode Island	996,757	71,021	191,789	392,377	186,514	155,056
Connecticut	3,275,251	231,460	631,458	1,275,736	671,757	464,840
Middle Atlantic:						
New York	18,169,051	1,382,421	3,583,621	7,109,815	3,699,728	2,393,466
New Jersey	7,903,925	578,702	1,543,106	3,062,042	1,642,282	1,077,793
Pennsylvania	12,052,367	798,951	2,397,181	4,472,799	2,464,880	1,918,556
East North Central:						
Ohio	11,102,198	783,760	2,371,761	4,223,553	2,232,438	1,490,686
Indiana	5,752,073	407,236	1,230,216	2,223,459	1,156,632	734,530
Illinois	11,751,774	915,046	2,480,116	4,580,308	2,295,125	1,481,179
Michigan	9,496,147	701,129	2,082,797	3,669,134	1,863,382	1,179,705
Wisconsin	5,081,658	349,900	1,135,484	1,931,096	981,723	683,455
West North Central:						
Minnesota	4,567,267	326,599	1,033,112	1,775,649	859,551	572,356
Iowa	2,829,252	187,597	620,223	1,021,767	562,697	436,968
Missouri	5,277,640	375,974	1,143,800	1,964,941	1,047,723	745,202
North Dakota	637,988	42,760	147,690	235,668	117,984	93,886
South Dakota	721,164	54,111	175,733	254,120	131,236	105,964
Nebraska	1,622,858	115,637	372,482	596,355	308,803	229,581
Kansas	2,554,047	184,433	577,176	958,116	480,492	353,830
South Atlantic:						
Delaware	706,351	50,985	141,214	285,360	139,360	89,432
Maryland	5,006,265	378,990	1,001,961	2,059,358	1,006,486	559,470
District of Columbia	570,175	42,655	86,751	252,321	111,471	76,977
Virginia	6,551,522	469,069	1,307,695	2,728,578	1,320,985	725,195
West Virginia	1,822,021	108,249	376,289	655,694	401,679	280,110
North Carolina	7,069,836	509,993	1,435,026	2,806,272	1,433,574	884,971
South Carolina	3,663,984	273,914	784,309	1,439,646	730,866	435,249
Georgia	7,055,336	548,576	1,539,830	2,900,099	1,357,294	709,537
Florida	13,952,714	962,261	2,618,390	5,002,488	2,798,851	2,570,724
East South Central:						
Kentucky	3,826,794	260,858	821,779	1,468,252	787,348	488,557
Tennessee	5,175,240	365,657	1,071,737	1,998,044	1,081,449	658,353
Alabama	4,218,792	301,848	901,945	1,600,493	862,137	552,369
Mississippi	2,669,111	207,085	635,059	989,041	505,612	332,314
West South Central:						
Arkansas	2,452,671	172,042	540,517	874,728	503,112	362,272
Louisiana	4,315,085	337,446	1,031,349	1,629,309	823,364	493,617
Oklahoma	3,258,069	237,352	736,844	1,181,966	659,236	442,671
Texas	18,378,185	1,559,347	4,284,057	7,281,742	3,384,806	1,866,233
Mountain:						
Montana	856,047	58,834	203,853	301,486	178,036	113,838
Idaho	1,133,034	87,443	289,596	407,322	216,694	131,979
Wyoming	475,981	33,055	119,616	175,366	95,309	52,635
Colorado	3,655,647	270,190	796,765	1,482,176	739,063	367,453
New Mexico	1,653,521	139,517	406,675	612,010	314,243	181,076
Arizona	4,075,052	344,032	903,067	1,529,454	752,659	545,840
Utah	1,907,936	181,365	562,217	704,684	291,338	168,332
Nevada	1,457,028	114,554	294,798	577,644	305,170	164,862
Pacific:						
Washington	5,343,090	393,961	1,153,742	2,126,472	1,050,714	618,201
Oregon	3,086,188	208,735	655,468	1,164,999	635,049	421,937
California	31,430,697	2,833,355	6,653,996	12,998,690	5,598,225	3,346,431
Alaska	606,276	55,608	154,229	258,007	110,358	28,074
Hawaii	1,178,564	95,054	241,783	468,297	231,395	142,035
Puerto Rico	3,687,158	---	---	---	---	---
Virgin Islands	---	---	---	---	---	---
Guam	---	---	---	---	---	---

SOURCE: Published and unpublished data from the U.S. Bureau of the Census; see text.

Table J. Estimated Population by 5-Year Age Groups, Specified Hispanic Origin, Race for Non-Hispanic Origin, and Sex: Total of 49 States and the District of Columbia, July 1, 1994

[Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Sex and age	All origins	Hispanic					Non-Hispanic		
		Total	Mexican	Puerto Rican	Cuban	Other Hispanic [1]	Total [2]	White	Black
Both sexes									
All ages	257,022,091	25,957,544	16,709,711	2,666,754	1,101,295	5,479,784	231,064,547	189,980,887	30,987,597
Under 1 year . .	3,826,553	637,225	460,489	52,377	11,626	112,733	3,189,328	2,422,087	577,905
1-4 years	15,649,659	2,439,593	1,730,777	230,102	41,595	437,119	13,210,066	10,152,827	2,345,795
5-9 years	18,612,036	2,512,924	1,770,249	263,081	58,919	420,675	16,099,112	12,518,618	2,771,956
10-14 years . . .	18,458,328	2,341,989	1,589,479	269,921	60,895	421,694	16,116,339	12,544,977	2,716,560
15-19 years . . .	17,378,508	2,190,079	1,453,191	251,386	47,934	437,568	15,188,429	11,834,584	2,596,785
20-24 years . . .	18,125,684	2,329,325	1,576,773	179,682	63,165	509,705	15,796,359	12,444,014	2,513,919
25-29 years . . .	18,937,634	2,473,517	1,625,899	218,263	69,342	560,013	16,464,117	13,136,810	2,466,911
30-34 years . . .	21,927,234	2,446,535	1,558,787	240,023	81,837	565,888	19,480,699	15,845,047	2,685,626
35-39 years . . .	21,702,610	2,051,868	1,251,355	212,596	89,336	498,581	19,650,742	16,157,327	2,595,652
40-44 years . . .	19,449,122	1,624,486	995,465	174,049	75,958	379,014	17,824,636	14,840,160	2,182,925
45-49 years . . .	16,470,278	1,223,038	694,659	156,311	77,009	295,059	15,247,240	12,952,412	1,661,157
50-54 years . . .	13,009,080	909,369	514,562	115,981	67,117	211,709	12,099,711	10,368,235	1,277,790
55-59 years . . .	10,774,948	735,774	411,394	90,474	71,122	162,784	10,039,174	8,618,169	1,061,992
60-64 years . . .	9,954,135	615,071	331,847	72,438	71,724	139,062	9,339,064	8,090,286	946,428
65-69 years . . .	9,844,512	520,245	297,559	42,365	67,188	113,133	9,324,267	8,197,128	874,057
70-74 years . . .	8,625,821	382,199	190,648	44,444	55,336	91,771	8,243,622	7,383,408	666,024
75-79 years . . .	6,488,094	242,418	109,633	21,286	46,292	65,207	6,245,676	5,647,421	480,264
80-84 years . . .	4,291,895	160,094	87,045	17,929	19,753	35,367	4,131,801	3,757,112	307,305
85 years + ...	3,495,960	121,795	59,900	14,046	25,147	22,702	3,374,165	3,070,265	258,546
Male									
All ages	125,465,333	13,150,296	8,642,375	1,250,872	529,548	2,727,501	112,315,037	92,774,299	14,653,073
Under 1 year . .	1,958,722	327,484	250,049	21,662	6,648	49,125	1,631,238	1,241,361	293,196
1-4 years	8,010,152	1,245,663	870,605	112,648	23,255	239,155	6,764,489	5,212,612	1,190,782

Table J. Estimated Population by 5-Year Age Groups, Specified Hispanic Origin, Race for Non-Hispanic Origin, and Sex: Total of 49 States and the District of Columbia, July 1, 1994

[Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Sex and age	All origins	Hispanic					Non-Hispanic		
		Total	Mexican	Puerto Rican	Cuban	Other Hispanic [1]	Total [2]	White	Black
5-9 years	9,537,937	1,286,710	880,397	146,201	27,381	232,731	8,251,227	6,434,844	1,404,375
10-14 years . . .	9,453,210	1,194,629	806,861	143,720	26,780	217,268	8,258,581	6,450,658	1,375,747
15-19 years . . .	8,912,271	1,123,218	747,124	130,009	26,918	219,167	7,789,053	6,087,546	1,316,983
20-24 years . . .	9,213,696	1,240,355	849,045	81,830	30,809	278,671	7,973,341	6,316,413	1,235,851
25-29 years . . .	9,503,238	1,328,114	908,570	95,541	32,327	291,676	8,175,124	6,588,179	1,171,633
30-34 years . . .	10,931,280	1,281,142	839,600	103,950	40,655	296,937	9,650,138	7,937,673	1,251,103
35-39 years . . .	10,796,885	1,053,394	663,103	94,296	51,415	244,580	9,743,491	8,109,236	1,208,177
40-44 years . . .	9,602,045	812,197	531,662	72,552	32,749	175,234	8,789,848	7,411,586	1,008,039
45-49 years . . .	8,089,769	601,040	363,112	69,718	39,036	129,174	7,488,729	6,436,452	753,284
50-54 years . . .	6,310,983	435,944	251,966	58,450	37,475	88,053	5,875,039	5,089,060	571,562
55-59 years . . .	5,165,263	345,669	193,160	35,086	35,081	82,342	4,819,594	4,183,550	465,950
60-64 years . . .	4,679,923	284,601	165,178	28,288	28,403	62,732	4,395,322	3,855,182	407,157
65-69 years . . .	4,434,137	230,215	133,775	21,734	29,495	45,211	4,203,922	3,724,693	371,594
70-74 years . . .	3,740,147	166,859	89,149	18,674	27,679	31,357	3,573,288	3,218,024	269,995
75-79 years . . .	2,621,013	96,046	45,138	6,238	20,462	24,208	2,524,967	2,295,265	178,656
80-84 years . . .	1,529,641	56,609	33,976	5,057	5,694	11,882	1,473,032	1,339,488	103,854
85 years + ...	975,021	40,407	19,905	5,218	7,286	7,998	934,614	842,477	75,135
Female									
All ages	131,556,758	12,807,248	8,067,336	1,415,882	571,747	2,752,283	118,749,510	97,206,588	16,334,524
Under 1 year . .	1,867,831	309,741	210,440	30,715	4,978	63,608	1,558,090	1,180,726	284,709
1-4 years	7,639,507	1,193,930	860,172	117,454	18,340	197,964	6,445,577	4,940,215	1,155,013
5-9 years	9,074,099	1,226,214	889,852	116,880	31,538	187,944	7,847,885	6,083,774	1,367,581
10-14 years . . .	9,005,118	1,147,360	782,618	126,201	34,115	204,426	7,857,758	6,094,319	1,340,813
15-19 years . . .	8,466,237	1,066,861	706,067	121,377	21,016	218,401	7,399,376	5,747,038	1,279,802
20-24 years . . .	8,911,988	1,088,970	727,728	97,852	32,356	231,034	7,823,018	6,127,601	1,278,068
25-29 years . . .	9,434,396	1,145,403	717,329	122,722	37,015	268,337	8,288,993	6,548,631	1,295,278

Table J. Estimated Population by 5-Year Age Groups, Specified Hispanic Origin, Race for Non-Hispanic Origin, and Sex: Total of 49 States and the District of Columbia, July 1, 1994

[Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Sex and age	All origins	Hispanic					Non-Hispanic		
		Total	Mexican	Puerto Rican	Cuban	Other Hispanic [1]	Total [2]	White	Black
30-34 years . . .	10,995,954	1,165,393	719,187	136,073	41,182	268,951	9,830,561	7,907,374	1,434,523
35-39 years . . .	10,905,725	998,474	588,252	118,300	37,921	254,001	9,907,251	8,048,091	1,387,475
40-44 years . . .	9,847,077	812,289	463,803	101,497	43,209	203,780	9,034,788	7,428,574	1,174,886
45-49 years . . .	8,380,509	621,998	331,547	86,593	37,973	165,885	7,758,511	6,515,960	907,873
50-54 years . . .	6,698,097	473,425	262,596	57,531	29,642	123,656	6,224,672	5,279,175	706,228
55-59 years . . .	5,609,685	390,105	218,234	55,388	36,041	80,442	5,219,580	4,434,619	596,042
60-64 years . . .	5,274,212	330,470	166,669	44,150	43,321	76,330	4,943,742	4,235,104	539,271
65-69 years . . .	5,410,375	290,030	163,784	20,631	37,693	67,922	5,120,345	4,472,435	502,463
70-74 years . . .	4,885,674	215,340	101,499	25,770	27,657	60,414	4,670,334	4,165,384	396,029
75-79 years . . .	3,867,081	146,372	64,495	15,048	25,830	40,999	3,720,709	3,352,156	301,608
80-84 years . . .	2,762,254	103,485	53,069	12,872	14,059	23,485	2,658,769	2,417,624	203,451
85 years + ...	2,520,939	81,388	39,995	8,828	17,861	14,704	2,439,551	2,227,788	183,411

1/ Includes Central and South American and Other and unknown Hispanic.
2/ Includes races other than white and black.

Table K. Estimated Population for Ages 15 Years and Over, by 5-Year Age Groups, Marital Status, Race, and Sex: United States, 1994

[Figures may be subject to large sampling variability. Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Race, sex, and marital status	15 years and over	15-17 years	18-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years
White, male									
Never married	23,717,985	4,350,262	2,767,381	5,969,411	3,772,993	2,417,463	1,587,356	995,114	632,635
Married	50,819,122	19,096	73,938	1,473,452	3,759,322	6,028,795	6,546,668	6,167,831	5,477,822
Widowed	1,985,198	770	1,438	1,461	7,754	6,878	25,386	26,922	45,702
Divorced	6,266,022	5,564	3,166	82,531	354,207	764,890	1,005,735	1,060,323	907,742
White, female									
Never married	18,053,554	4,051,454	2,432,466	4,530,340	2,362,162	1,453,515	895,796	592,070	386,264
Married	51,361,741	54,027	250,718	2,453,904	4,740,333	6,612,498	6,837,056	6,359,127	5,439,451
Widowed	10,326,316	-	800	9,526	24,228	58,108	95,996	103,609	222,178
Divorced	8,430,081	7,048	17,316	201,419	572,104	950,265	1,243,468	1,211,360	1,136,827
Black, male									
Never married	5,168,827	845,522	529,081	1,166,265	820,870	659,942	470,878	262,348	160,603
Married	4,622,817	2,851	4,392	134,688	386,288	575,367	665,503	642,607	493,484
Widowed	314,577	-	-	2,097	-	-	7,110	8,573	11,875
Divorced	861,998	2,807	-	9,634	42,946	94,527	136,352	155,700	127,301
Black, female									
Never married	5,032,523	815,495	515,406	1,109,548	819,810	630,367	449,095	268,948	159,430
Married	4,838,822	4,457	11,532	221,934	480,286	673,653	718,645	666,507	538,057
Widowed	1,418,268	-	1,335	2,749	-	13,846	24,920	38,164	47,821
Divorced	1,493,510	-	368	20,993	68,742	188,892	260,791	265,195	201,077
American Indian, male									
Never married	286,566	60,738	34,309	74,383	41,436	30,311	18,649	10,726	6,391
Married	366,642	1,074	1,648	21,526	43,577	48,515	53,101	49,705	39,985
Widowed	12,908	-	-	-	-	476	-	-	-
Divorced	90,555	-	-	447	6,670	13,999	13,563	12,947	11,739
American Indian, female									
Never married	234,316	59,156	32,277	48,230	40,989	24,616	11,674	5,965	4,760
Married	379,786	580	2,590	34,464	39,660	52,993	61,127	53,719	34,168
Widowed	74,711	-	728	-	-	2,149	300	3,732	3,916
Divorced	99,712	-	-	7,909	5,884	14,045	15,310	14,435	18,762
Asian or Pacific Islander, male									
Never married	1,183,397	202,043	128,837	339,209	251,935	129,650	67,295	25,248	12,818
Married	1,916,604	759	445	36,239	125,833	279,595	306,480	295,591	241,987
Widowed	30,780	-	-	-	-	-	-	-	1,170
Divorced	78,492	-	-	-	4,964	7,552	16,103	14,760	9,546
Asian or Pacific Islander, female									
Never married	943,086	194,005	120,416	286,742	148,711	64,399	47,686	27,188	13,878
Married	2,157,757	968	5,966	84,645	250,667	358,862	338,000	326,621	243,276
Widowed	259,568	961	-	496	-	1,509	8,222	4,486	17,217
Divorced	176,329	-	199	2,254	4,504	19,558	32,367	29,246	31,380

Table K. Estimated Population for Ages 15 Years and Over, by 5-Year Age Groups, Marital Status, Race, and Sex: United States, 1994 -- Con.

[Figures may be subject to large sampling variability. Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Race, sex, and marital status	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85 years and over
White, male								
Never married	285,979	244,573	164,278	201,004	139,366	90,735	51,310	48,125
Married	4,627,808	3,723,592	3,480,440	3,250,493	2,766,177	1,887,829	1,021,051	514,808
Widowed	64,519	91,693	146,566	276,894	342,165	345,012	298,943	303,095
Divorced	594,031	513,602	380,752	269,729	172,756	90,815	40,843	19,336
White, female								
Never married	260,042	180,538	167,205	147,682	181,064	139,117	106,940	166,899
Married	4,332,516	3,553,752	3,204,032	2,919,262	2,278,829	1,332,015	656,212	338,009
Widowed	287,589	447,085	711,524	1,348,047	1,665,495	1,904,190	1,688,835	1,759,106
Divorced	902,083	681,452	517,806	378,564	293,922	158,988	97,828	59,631
Black, male								
Never married	79,548	60,075	51,145	16,109	21,054	13,127	3,451	8,809
Married	399,263	359,021	264,706	287,218	189,630	120,256	66,959	30,584
Widowed	17,761	11,445	53,726	45,952	41,649	44,378	33,033	36,978
Divorced	105,508	56,618	54,067	36,870	26,280	10,069	3,319	-
Black, female								
Never married	73,922	57,803	43,653	31,984	28,806	8,383	8,752	11,121
Married	417,270	347,047	270,203	219,570	133,130	78,705	42,134	15,692
Widowed	86,693	121,562	161,159	201,859	203,388	212,512	146,032	156,228
Divorced	159,738	96,813	85,404	66,199	49,877	11,658	12,602	5,161
American Indian, male								
Never married	3,155	4,045	467	-	1,173	-	-	783
Married	33,418	23,415	14,043	16,671	12,844	5,728	426	966
Widowed	-	808	1,206	946	493	3,418	2,817	2,744
Divorced	6,866	5,346	10,782	3,355	1,320	749	2,772	-
American Indian, female								
Never married	1,899	2,114	333	478	-	1,825	-	-
Married	29,539	24,061	15,732	11,625	8,734	6,382	4,412	-
Widowed	8,368	3,301	11,859	11,893	10,311	5,695	5,148	7,311
Divorced	7,379	7,714	2,461	1,577	1,440	575	218	2,003
Asian or Pacific Islander, male								
Never married	6,287	1,088	2,967	6,951	3,206	1,674	-	4,189
Married	174,463	135,249	110,673	84,605	60,864	34,097	21,159	8,565
Widowed	632	4,354	1,058	2,992	8,124	7,585	3,996	869
Divorced	11,074	8,991	2,706	-	2,796	-	-	-
Asian or Pacific Islander, female								
Never married	12,465	2,816	1,227	9,490	4,738	3,147	5,098	1,080
Married	164,253	139,715	99,130	78,018	37,839	18,849	7,050	3,898
Widowed	19,688	13,961	33,409	40,158	48,236	36,241	19,374	15,610
Divorced	17,531	11,951	17,271	4,254	5,534	280	-	-

SOURCE: Population estimates based on unpublished tabulations prepared by the Housing and Household Economic Statistics Division, U.S. Bureau of the Census; see text.

Table L. Estimated Population for Ages 15 Years and Over, by 5-Year Age Groups, Marital Status, Specified Hispanic Origin, Race for Non-Hispanic Origin, and Sex: Total of 49 States and the District of Columbia, 1994

[Figures may be subject to large sampling variability. Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Hispanic origin, race for non-Hispanic origin, sex, and marital status	15 years and over	15-17 years	18-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years
Mexican, male									
Never married	2,265,009	431,881	289,458	622,418	431,488	204,559	130,495	66,581	37,463
Married	3,124,230	9,604	14,182	223,916	439,383	579,241	456,784	420,346	279,113
Widowed	99,318	-	-	-	193	1,146	2,528	2,404	4,623
Divorced	345,902	2,000	-	2,718	37,506	54,645	73,296	42,326	41,914
Mexican, female									
Never married	1,540,797	410,501	215,300	371,069	210,398	140,681	71,441	36,678	20,061
Married	3,101,182	17,408	61,705	341,667	473,500	526,328	433,777	357,219	258,838
Widowed	313,158	-	524	1,433	670	3,714	9,783	13,987	14,383
Divorced	369,106	-	625	13,556	32,765	48,464	73,254	55,915	38,267
Puerto Rican, male									
Never married	344,487	77,626	48,937	64,380	45,831	43,343	20,239	13,644	16,456
Married	396,797	-	2,199	16,788	45,233	54,355	63,725	49,104	46,629
Widowed	22,291	-	-	-	897	-	-	-	-
Divorced	63,059	1,249	-	663	3,582	6,251	10,331	9,802	6,633
Puerto Rican, female									
Never married	341,754	75,688	35,051	64,902	47,961	41,760	24,456	17,249	12,743
Married	498,270	3,574	7,065	29,991	69,514	75,081	72,221	65,947	59,985
Widowed	77,317	-	-	562	408	3,331	1,018	2,640	3,983
Divorced	107,280	-	-	2,399	4,840	15,899	20,602	15,662	9,881
Cuban, male									
Never married	124,140	14,672	11,362	24,653	17,211	12,561	15,474	5,441	7,676
Married	275,144	-	883	6,156	12,330	26,210	32,816	23,499	26,265
Widowed	13,101	-	-	-	-	-	-	-	-
Divorced	33,102	-	-	-	2,786	1,886	3,126	3,806	5,095
Cuban, female									
Never married	78,066	14,401	6,402	20,772	10,273	5,129	3,297	366	3,044
Married	270,034	-	213	9,787	22,719	28,129	28,029	32,230	27,071
Widowed	61,783	-	-	-	-	846	-	1,398	2,504
Divorced	72,895	-	-	1,798	4,023	7,079	6,594	9,214	5,355
Other Hispanic, male									
Never married	835,780	134,549	80,826	233,524	165,065	100,154	60,129	20,048	17,386
Married	1,025,419	360	1,904	43,551	117,826	175,981	169,785	132,605	103,719
Widowed	27,622	-	-	-	-	-	360	-	1,696
Divorced	100,404	-	1,527	1,593	8,781	20,804	14,306	22,586	6,373
Other Hispanic, female									
Never married	614,816	113,682	89,808	149,679	91,762	51,288	30,765	27,247	17,804
Married	1,147,602	2,486	11,964	74,625	162,775	198,021	185,548	146,163	113,284
Widowed	149,884	-	-	572	552	1,931	7,123	2,945	8,054
Divorced	186,042	317	144	6,158	13,254	17,707	30,564	27,424	26,745

Table L. Estimated Population for Ages 15 Years and Over, by 5-Year Age Groups, Marital Status, Specified Hispanic Origin, Race for Non-Hispanic Origin, and Sex: Total of 49 States and the District of Columbia, 1994 -- Con.

[Figures may be subject to large sampling variability. Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Hispanic origin, race for non-Hispanic origin, sex, and marital status	15 years and over	15-17 years	18-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years
White Non-Hispanic, male									
Never married	20,230,558	3,690,101	2,329,720	5,061,451	3,142,157	2,063,960	1,380,493	888,035	559,993
Married	45,709,925	8,965	52,606	1,176,028	3,142,367	5,193,272	5,804,008	5,515,487	4,994,121
Widowed	1,807,579	786	1,460	1,495	6,812	5,183	20,382	24,747	39,230
Divorced	5,686,736	2,247	1,667	77,433	296,843	675,261	904,353	983,321	843,088
White Non-Hispanic, female									
Never married	15,573,971	3,432,840	2,090,026	3,964,787	2,021,326	1,227,769	778,881	510,771	336,098
Married	46,070,210	29,317	170,608	1,980,180	3,998,041	5,776,790	6,096,721	5,743,533	4,931,961
Widowed	9,636,051	-	818	6,542	22,975	49,455	76,503	81,411	190,993
Divorced	7,627,307	6,834	16,606	176,092	506,287	853,356	1,095,980	1,092,861	1,056,903
Black Non-Hispanic, male									
Never married	4,883,203	803,650	503,591	1,101,595	771,288	622,143	442,368	246,565	149,530
Married	4,383,425	2,772	4,243	122,793	360,308	539,753	629,570	606,364	470,355
Widowed	305,610	-	-	2,048	-	-	6,940	8,318	11,549
Divorced	816,737	2,727	-	9,409	40,035	89,206	129,294	146,796	121,859
Black Non-Hispanic, female									
Never married	4,771,374	772,575	492,501	1,042,293	777,196	602,576	427,164	250,444	155,625
Married	4,612,320	4,292	8,763	212,641	451,625	638,505	684,669	630,954	513,802
Widowed	1,370,164	-	1,310	2,679	-	11,777	24,275	36,453	46,784
Divorced	1,432,554	-	361	20,456	66,457	181,662	251,366	257,040	191,660
Other Non-Hispanic, male									
Never married	1,322,941	234,415	146,363	373,176	251,406	154,306	78,732	33,028	17,457
Married	2,066,767	1,509	2,234	47,383	152,535	285,355	321,496	313,336	261,897
Widowed	40,868	-	-	-	-	523	-	-	386
Divorced	155,117	-	-	517	11,368	21,177	25,847	23,861	19,252
Other Non-Hispanic, female									
Never married	1,070,678	224,918	138,372	300,572	177,823	83,872	53,707	35,563	13,150
Married	2,319,074	1,253	7,152	111,642	260,522	365,513	368,513	346,871	260,505
Widowed	307,405	843	-	445	-	3,494	7,942	7,623	18,353
Divorced	249,088	-	-	4,694	6,741	35,780	41,523	41,278	42,667

Table L. Estimated Population for Ages 15 Years and Over, by 5-Year Age Groups, Marital Status, Specified Hispanic Origin, Race for Non-Hispanic Origin, and Sex: Total of 49 States and the District of Columbia, 1994 -- Con.

[Figures may be subject to large sampling variability. Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Hispanic origin, race for non-Hispanic origin, sex, and marital status	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85 years and over
Mexican, male								
Never married	13,320	13,617	5,858	4,440	3,352	1,949	952	7,178
Married	201,178	151,860	132,492	96,874	65,397	27,060	20,136	6,664
Widowed	10,533	5,679	12,001	15,036	17,365	10,892	10,853	6,065
Divorced	26,936	22,006	14,826	17,427	3,032	5,237	2,033	-
Mexican, female								
Never married	15,434	15,528	6,893	7,981	7,022	4,386	2,286	5,138
Married	195,804	156,337	96,353	98,305	50,673	14,301	15,291	3,676
Widowed	13,356	28,534	41,910	44,065	35,342	41,148	34,496	29,813
Divorced	37,998	17,837	21,515	13,430	8,458	4,659	996	1,367
Puerto Rican, male								
Never married	6,342	1,951	771	1,326	3,641	-	-	-
Married	39,924	25,698	24,917	12,141	7,140	4,032	3,631	1,281
Widowed	1,946	-	626	4,741	7,619	1,099	1,426	3,937
Divorced	10,237	7,436	1,974	3,525	271	1,105	-	-
Puerto Rican, female								
Never married	4,972	4,252	3,693	3,271	1,756	1,980	421	1,599
Married	38,039	28,582	22,951	7,226	8,239	6,435	2,283	1,137
Widowed	3,364	12,535	7,918	8,292	11,122	5,881	10,169	6,094
Divorced	11,152	10,013	9,590	1,841	4,651	750	-	-
Cuban, male								
Never married	4,060	6,774	2,184	371	362	1,339	-	-
Married	28,486	27,279	23,759	23,564	20,188	13,436	5,089	5,184
Widowed	-	-	-	1,483	4,191	5,243	605	1,579
Divorced	4,929	1,028	2,462	4,077	2,937	446	-	524
Cuban, female								
Never married	1,203	1,498	1,336	1,881	2,332	970	3,492	1,670
Married	19,598	28,102	30,330	19,917	9,301	8,697	2,565	3,346
Widowed	536	-	6,059	5,480	13,249	13,964	8,003	9,744
Divorced	8,306	6,439	5,598	10,415	2,777	2,198	-	3,099
Other Hispanic, male								
Never married	5,184	9,552	3,971	3,423	741	305	923	-
Married	74,440	59,602	51,232	36,650	25,713	15,901	10,729	5,421
Widowed	-	8,544	3,162	2,425	2,818	6,039	-	2,578
Divorced	8,427	4,645	4,371	2,715	2,085	1,962	229	-
Other Hispanic, female								
Never married	11,632	3,531	8,609	4,044	6,881	6,159	1,289	636
Married	80,015	45,167	44,633	37,824	23,957	12,039	7,636	1,465
Widowed	11,070	14,581	15,430	16,977	24,967	18,966	14,115	12,601
Divorced	20,937	17,163	7,659	9,078	4,611	3,836	445	-

Table L. Estimated Population for Ages 15 Years and Over, by 5-Year Age Groups, Marital Status, Specified Hispanic Origin, Race for Non-Hispanic Origin, and Sex: Total of 49 States and the District of Columbia, 1994 -- Con.

[Figures may be subject to large sampling variability. Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States]

Hispanic origin, race for non-Hispanic origin, sex, and marital status	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80-84 years	85 years and over
White Non-Hispanic, male								
Never married	255,767	212,022	154,229	187,205	129,466	87,460	49,045	39,454
Married	4,241,554	3,423,774	3,220,550	3,044,615	2,622,093	1,803,306	970,178	497,001
Widowed	51,943	76,460	127,454	250,781	306,791	321,982	285,041	287,032
Divorced	539,792	471,298	352,940	242,091	159,670	82,518	35,221	18,993
White Non-Hispanic, female								
Never married	227,842	158,698	146,102	130,841	164,228	127,292	99,156	157,314
Married	3,969,981	3,263,924	2,985,549	2,735,492	2,161,417	1,276,415	622,241	328,040
Widowed	260,435	390,686	635,907	1,263,628	1,567,036	1,800,285	1,601,700	1,687,677
Divorced	820,907	621,312	467,543	342,474	272,706	148,170	94,521	54,755
Black Non-Hispanic, male								
Never married	76,952	56,166	48,269	15,369	20,811	12,824	3,415	8,667
Married	377,018	345,829	254,457	276,175	184,775	113,618	65,306	30,089
Widowed	17,396	11,258	52,143	45,006	39,500	42,381	32,693	36,378
Divorced	100,191	52,698	52,292	35,041	24,912	9,836	2,441	-
Black Non-Hispanic, female								
Never married	69,438	54,458	41,407	30,968	26,916	7,933	8,706	11,174
Married	401,769	331,840	260,882	213,066	126,591	77,869	40,040	15,012
Widowed	83,642	115,235	153,988	196,204	196,914	205,164	143,698	152,041
Divorced	151,377	94,510	82,991	62,229	45,615	10,641	11,004	5,185
Other Non-Hispanic, male								
Never married	8,370	4,679	3,107	5,764	6,192	1,643	-	4,303
Married	189,014	147,628	113,745	93,752	66,777	39,112	23,064	7,930
Widowed	566	4,797	2,081	4,983	7,547	9,777	5,440	4,768
Divorced	16,465	12,990	14,051	3,136	4,755	512	1,186	-
Other Non-Hispanic, female								
Never married	13,428	3,458	1,481	8,974	4,491	4,641	4,908	1,320
Married	176,333	151,066	105,545	85,729	41,119	23,414	9,134	4,763
Widowed	25,776	14,386	42,061	45,379	57,439	38,611	23,470	21,583
Divorced	23,734	20,006	20,278	5,368	5,870	280	182	687

Table M. Ratio of Census-Level Resident Population to Resident Population Adjusted for Estimated net Census Undercount by Age, Sex, and Race: April 1, 1990

Age	All races			White			Black		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	0.9815	0.9721	0.9906	0.9802	0.9728	0.9873	0.9432	0.9151	0.9699
Under 5 years	0.9632	0.9634	0.9629	0.9677	0.9685	0.9669	0.9160	0.9139	0.9182
Under 1 year	.9686	.9684	.9689	.9730	.9734	.9725	.9239	.9214	.9264
1-4 years	.9617	.9621	.9613	.9664	.9672	.9654	.9139	.9119	.9159
5-14 years	.9761	.9768	.9753	.9740	.9750	.9730	.9410	.9402	.9418
5-9 years	.9649	.9655	.9642	.9657	.9665	.9649	.9241	.9230	.9252
10-14 years	.9882	.9891	.9873	.9830	.9841	.9818	.9591	.9586	.9595
15-24 years	1.0081	1.0088	1.0073	1.0032	1.0053	1.0010	.9789	.9723	.9855
15-19 years	1.0166	1.0198	1.0133	1.0094	1.0128	1.0059	.9988	1.0016	.9959
20-24 years	1.0002	.9987	1.0017	.9975	.9985	.9966	.9593	.9432	.9753
25-34 years	.9639	.9463	.9821	.9614	.9480	.9755	.9126	.8666	.9580
25-29 years	.9591	.9439	.9748	.9558	.9441	.9681	.9123	.8732	.9510
30-34 years	.9687	.9487	.9892	.9669	.9518	.9828	.9129	.8599	.9651
35-44 years	.9842	.9689	.9996	.9816	.9700	.9935	.9350	.8867	.9810
35-39 years	.9790	.9628	.9954	.9764	.9643	.9888	.9303	.8808	.9778
40-44 years	.9901	.9758	1.0044	.9875	.9764	.9988	.9410	.8943	.9850
45-54 years	.9780	.9628	.9929	.9772	.9649	.9894	.9322	.8805	.9799
45-49 years	.9775	.9633	.9916	.9762	.9648	.9877	.9302	.8807	.9762
50-54 years	.9785	.9623	.9944	.9784	.9651	.9914	.9346	.8802	.9844
55-64 years	.9824	.9640	.9995	.9828	.9684	.9962	.9545	.8875	1.0138
55-59 years	.9794	.9609	.9968	.9801	.9656	.9941	.9426	.8790	.9999
60-64 years	.9854	.9671	1.0020	.9853	.9712	.9982	.9675	.8969	1.0287
65-74 years	.9960	.9784	1.0101	.9935	.9781	1.0060	1.0211	.9704	1.0596
65-69 years	.9980	.9776	1.0152	.9943	.9762	1.0096	1.0336	.9786	1.0773
70-74 years	.9934	.9795	1.0040	.9926	.9807	1.0017	1.0049	.9589	1.0376
75-84 years	1.0021	1.0046	1.0006	1.0038	1.0066	1.0021	.9971	.9913	1.0004
75-79 years	1.0082	1.0064	1.0094	1.0077	1.0065	1.0085	1.0258	1.0126	1.0337
80-84 years	.9927	1.0015	.9881	.9978	1.0068	.9931	.9524	.9547	.9512
85 years and over	.9411	.9592	.9342	.9512	.9696	.9444	.8503	.8827	.8373

SOURCE: Unpublished data from the U.S. Bureau of the Census.

Table N. Age-adjusted death rates for selected causes by race and sex, unadjusted and adjusted for estimated net census undercount: United States, 1990

[Based on age-specific death rates per 100,000 population in specified group. Age-adjusted death rates per 100,000 U.S. standard population. Numbers after causes of deaths are numbers of the Ninth Revision, International Classification of Diseases, 1975. Beginning 1987 includes category numbers *042-*044. See section "Cause of death"]

Race, sex, and adjustment for net census undercount	All causes	Human immunodeficiency virus infection (*042-*044)	Malignant neoplasms, including neoplasms of lymphatic and hematopoietic tissues (140-208)	Diabetes mellitus (250)	Diseases of heart (390-398,402, 404-429)	Cerebrovascular diseases (430-438)	Homicide and legal intervention (E960-E978)
All races							
Both sexes:							
Unadjusted	520.2	9.8	135.0	11.7	152.0	27.7	10.2
Adjusted	512.7	9.6	133.3	11.5	149.9	27.3	10.1
Male:							
Unadjusted	680.2	17.7	166.3	12.3	206.7	30.2	16.3
Adjusted	664.3	17.0	162.4	12.1	202.1	29.6	15.9
Female:							
Unadjusted	390.6	2.1	112.7	11.1	108.9	25.7	4.2
Adjusted	387.9	2.1	112.6	11.0	107.9	25.4	4.2
White							
Both sexes:							
Unadjusted	492.8	8.0	131.5	10.4	146.9	25.5	5.9
Adjusted	485.9	7.8	129.9	10.2	145.0	25.2	5.7
Male:							
Unadjusted	644.3	15.0	160.3	11.3	202.0	27.7	8.9
Adjusted	631.0	14.4	156.9	11.1	198.2	27.3	8.7
Female:							
Unadjusted	369.9	1.1	111.2	9.5	103.1	23.8	2.8
Adjusted	367.0	1.0	110.8	9.5	102.2	23.5	2.7
Black							
Both sexes:							
Unadjusted	789.2	25.7	182.0	24.8	213.5	48.4	39.5
Adjusted	760.0	23.9	177.0	24.1	207.2	46.9	37.4
Male:							
Unadjusted	1,061.3	44.2	248.1	23.6	275.9	56.1	68.7
Adjusted	980.8	39.0	230.9	21.9	256.7	52.3	62.9
Female:							
Unadjusted	581.6	9.9	137.2	25.4	168.1	42.7	13.0
Adjusted	579.4	9.7	138.4	25.7	168.2	42.7	12.7

Table O. Lower and upper 95% and 96% confidence limit factors for a death rate based on a Poisson variable of 1 through 99 deaths, D or D_{adj}

D or D_{adj}	L(1- a=.95,D)	U(1- a =.95,D)	L(1- a =.96,D) or L(1- a =.96,D_{adj})	U(1- a =.96,D) or U(1- a =.96,D_{adj})
1	0.02532	5.57164	0.02020	5.83392
2	0.12110	3.61234	0.10735	3.75830
3	0.20622	2.92242	0.18907	3.02804
4	0.27247	2.56040	0.25406	2.64510
5	0.32470	2.33367	0.30591	2.40540
6	0.36698	2.17658	0.34819	2.23940
7	0.40205	2.06038	0.38344	2.11666
8	0.43173	1.97040	0.41339	2.02164
9	0.45726	1.89831	0.43923	1.94553
10	0.47954	1.83904	0.46183	1.88297
11	0.49920	1.78928	0.48182	1.83047
12	0.51671	1.74680	0.49966	1.78566
13	0.53246	1.71003	0.51571	1.74688
14	0.54671	1.67783	0.53027	1.71292
15	0.55969	1.64935	0.54354	1.68289
16	0.57159	1.62394	0.55571	1.65610
17	0.58254	1.60110	0.56692	1.63203
18	0.59266	1.58043	0.57730	1.61024
19	0.60207	1.56162	0.58695	1.59042
20	0.61083	1.54442	0.59594	1.57230
21	0.61902	1.52861	0.60435	1.55563
22	0.62669	1.51401	0.61224	1.54026

Table O. Lower and upper 95% and 96% confidence limit factors for a death rate based on a Poisson variable of 1 through 99 deaths, D or D_{adj}

D or D_{adj}	L(1- a=.95,D)	U(1- a =.95,D)	L(1- a =.96,D) or L(1- a =.96,D_{adj})	U(1- a =.96,D) or U(1- a =.96,D_{adj})
23	0.63391	1.50049	0.61966	1.52602
24	0.64072	1.48792	0.62666	1.51278
25	0.64715	1.47620	0.63328	1.50043
26	0.65323	1.46523	0.63954	1.48888
27	0.65901	1.45495	0.64549	1.47805
28	0.66449	1.44528	0.65114	1.46787
29	0.66972	1.43617	0.65652	1.45827
30	0.67470	1.42756	0.66166	1.44922
31	0.67945	1.41942	0.66656	1.44064
32	0.68400	1.41170	0.67125	1.43252
33	0.68835	1.40437	0.67575	1.42480
34	0.69253	1.39740	0.68005	1.41746
35	0.69654	1.39076	0.68419	1.41047
36	0.70039	1.38442	0.68817	1.40380
37	0.70409	1.37837	0.69199	1.39743
38	0.70766	1.37258	0.69568	1.39134
39	0.71110	1.36703	0.69923	1.38550
40	0.71441	1.36172	0.70266	1.37991
41	0.71762	1.35661	0.70597	1.37454
42	0.72071	1.35171	0.70917	1.36938
43	0.72370	1.34699	0.71227	1.36442
44	0.72660	1.34245	0.71526	1.35964

Table O. Lower and upper 95% and 96% confidence limit factors for a death rate based on a Poisson variable of 1 through 99 deaths, D or D_{adj}

D or D_{adj}	L(1- a=.95,D)	U(1- a =.95,D)	L(1- a =.96,D) or L(1- a =.96,D_{adj})	U(1- a =.96,D) or U(1- a =.96,D_{adj})
45	0.72941	1.33808	0.71816	1.35504
46	0.73213	1.33386	0.72098	1.35060
47	0.73476	1.32979	0.72370	1.34632
48	0.73732	1.32585	0.72635	1.34218
49	0.73981	1.32205	0.72892	1.33818
50	0.74222	1.31838	0.73142	1.33431
51	0.74457	1.31482	0.73385	1.33057
52	0.74685	1.31137	0.73621	1.32694
53	0.74907	1.30802	0.73851	1.32342
54	0.75123	1.30478	0.74075	1.32002
55	0.75334	1.30164	0.74293	1.31671
56	0.75539	1.29858	0.74506	1.31349
57	0.75739	1.29562	0.74713	1.31037
58	0.75934	1.29273	0.74916	1.30734
59	0.76125	1.28993	0.75113	1.30439
60	0.76311	1.28720	0.75306	1.30152
61	0.76492	1.28454	0.75494	1.29873
62	0.76669	1.28195	0.75678	1.29601
63	0.76843	1.27943	0.75857	1.29336
64	0.77012	1.27698	0.76033	1.29077
65	0.77178	1.27458	0.76205	1.28826
66	0.77340	1.27225	0.76373	1.28580

Table O. Lower and upper 95% and 96% confidence limit factors for a death rate based on a Poisson variable of 1 through 99 deaths, D or D_{adj}

D or D_{adj}	L(1- a=.95,D)	U(1- a =.95,D)	L(1- a =.96,D) or L(1- a =.96,D_{adj})	U(1- a =.96,D) or U(1- a =.96,D_{adj})
67	0.77499	1.26996	0.76537	1.28340
68	0.77654	1.26774	0.76698	1.28106
69	0.77806	1.26556	0.76856	1.27877
70	0.77955	1.26344	0.77011	1.27654
71	0.78101	1.26136	0.77162	1.27436
72	0.78244	1.25933	0.77310	1.27223
73	0.78384	1.25735	0.77456	1.27014
74	0.78522	1.25541	0.77598	1.26810
75	0.78656	1.25351	0.77738	1.26610
76	0.78789	1.25165	0.77876	1.26415
77	0.78918	1.24983	0.78010	1.26223
78	0.79046	1.24805	0.78143	1.26036
79	0.79171	1.24630	0.78272	1.25852
80	0.79294	1.24459	0.78400	1.25672
81	0.79414	1.24291	0.78525	1.25496
82	0.79533	1.24126	0.78648	1.25323
83	0.79649	1.23965	0.78769	1.25153
84	0.79764	1.23807	0.78888	1.24987
85	0.79876	1.23652	0.79005	1.24824
86	0.79987	1.23499	0.79120	1.24664
87	0.80096	1.23350	0.79233	1.24507
88	0.80203	1.23203	0.79344	1.24352

Table O. Lower and upper 95% and 96% confidence limit factors for a death rate based on a Poisson variable of 1 through 99 deaths, D or D_{adj}

D or D_{adj}	L(1- a=.95,D)	U(1- a =.95,D)	L(1- a =.96,D) or L(1- a =.96,D_{adj})	U(1- a =.96,D) or U(1- a =.96,D_{adj})
89	0.80308	1.23059	0.79453	1.24201
90	0.80412	1.22917	0.79561	1.24052
91	0.80514	1.22778	0.79667	1.23906
92	0.80614	1.22641	0.79771	1.23762
93	0.80713	1.22507	0.79874	1.23621
94	0.80810	1.22375	0.79975	1.23482
95	0.80906	1.22245	0.80074	1.23345
96	0.81000	1.22117	0.80172	1.23211
97	0.81093	1.21992	0.80269	1.23079
98	0.81185	1.21868	0.80364	1.22949
99	0.81275	1.21746	0.80458	1.22822

NOTE: Table O was generated using the SAS® code below. Users can compute other level Confidence Intervals by changing the alpha-value. Table O is a modified version of Table 40 (60).

```
* Program to compute confidence intervals for expectations of Poisson variables ;
* Specify alpha for alpha*100% Confidence Interval  ;

%let alpha = .95;

data CI ;

    alo  = (1-&alpha)/2 ;
    ahi  = (&alpha+1)/2 ;

do n = 1 to 99;

   L = Gaminv ( alo,n )/n ;
   U = Gaminv (ahi,n+1)/n ;

 output;
 end;

proc print data= CI;
   var n  L U ;

run;
```