SECTION 6 - TECHNICAL APPENDIX

SOURCES OF DATA

Death and fetal-death statistics

Mortality statistics for 1978 are again, as for all previous years except 1972, based on information from all death records received by the National Center for Health Statistics (NCHS). The records are furnished by all the States, the District of Columbia, and the independent registration area of New York City. As a result of personnel and budgetary restrictions, mortality statistics for 1972 were based on information obtained from a 50-percent sample of death records instead of from all records. Fetal-death statistics for all years were based on fetal-death records received.

Although the United States vital statistics system covers the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam, in this report the term *United States* refers only to the aggregate of the 50 States (including New York City) and the District of Columbia.

Death statistics for Puerto Rico, the Virgin Islands, and Guam were not included for 1972 but are included in section 8 of the reports for each of the years 1973-78. The Virgin Islands was admitted to the "registration area" for deaths in 1924; Puerto Rico, in 1932; and Guam, in 1970. Tabulations for Puerto Rico and the Virgin Islands have been regularly shown in the annual volumes from the year of their admission through 1971 except for the years 1967 through 1969. Tabulations for Guam have been included for 1970 and 1971. Information for 1972 for these three areas is 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.

Another change from procedures for prior years, begun for 1971 and continued for 1972 through 1978, is that tabulations of deaths are based on information from two sources. Before 1971, tabulations of deaths and fetal deaths were based solely on information obtained from copies of the original certificates. The information from these copies was edited, classified, and tabulated. For 1960 and for each year thereafter through 1970, all mortality information taken from these records has been transferred by NCHS to magnetic tape for computer processing.

However, beginning with 1971 for demographic data and 1974 for medical data, tabulations are based on information derived from computer tapes of data coded by an increasing number of States according to NCHS specifications and provided to NCHS through the Cooperative Health Statistics System. The year in which utilization of State-coded data was begun is shown below for New York City, Puerto Rico, and each of the 36 States now furnishing demographic data.

1971

- Florida

1972

- Maine
- Missouri
- New Hampshire
- Rhode Island
- Vermont

1973

- Colorado
- Michigan
- New York (except New York City)

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

State-coded data were used beginning in 1974 for two States furnishing medical data (Iowa and Michigan) and in 1975 for five more States furnishing medical data (Louisiana, Nebraska, North Carolina, Virginia, and Wisconsin).

For the remaining 14 States, the District of Columbia, the Virgin Islands, and Guam, mortality statistics for 1978 are again based on information obtained directly from copies of the original certificates received from the registration offices. All fetal-death data are obtained directly from copies of the original reports.

Standard certificates and reports

The standard certificate of death and the standard report of fetal death, issued by the Public Health Service, have served for many years as the principal means of attaining uniformity in the content of the documents used to collect information on these events. They have been modified in each State to the extent necessitated 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 Standard Certificate of Death appeared shortly before the formation of the registration area. 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 assured careful evaluation of each item in terms of its current and future usefulness for registration, identification, legal, medical, and research purposes. New items have been added when necessary, and old items have been modified to ensure better reporting or in some cases have been dropped when their usefulness appeared to be limited.

New revisions of the standard certificate of death and report of fetal death were recommended for State use beginning January 1, 1978. The standard certificate of death and report of fetal death are shown in figures 6-A and 6-B. The certificate of death shown in figure 6-A is for use by either a physician or a medical examiner or a coroner. Two other forms of the Standard Certificate of Death are available; they are similar to the one shown except that the section on certification is designed for the physician's signature on one while the other is designed for the medical examiner's or coroner's signature.

HISTORY

The first death statistics published by the Federal Government concerned events in 1850 and included the entire United States. These statistics were based on information collected during the decennial census of that year. Similar decennial collections were made by census enumerators at each census up to and including the census of 1900, but because of the time interval between the occurrence of a death and census enumeration, these reports were inaccurate and incomplete.

In 1880 the U.S. Bureau of the Census established a national "registration area" for deaths. This original area consisted of two States—Massachusetts and New Jersey—the District of Columbia, and several large cities having efficient systems for death registrations. By 1900, eight other States had been admitted to the death-registration area. For 1880, 1890, and 1900, mortality data were received from the States and cities included in this expanding area, but the figures for the entire country were still compiled from the reports of census enumerators.

Beginning with 1900, mortality statistics were collected annually for the death-registration area. In 1902 the Bureau of the Census, which had previously functioned only in census years, was made a permanent agency by an act of Congress. This act authorized the Director of the Bureau of the Census to obtain annually copies of records filed in the vital statistics offices of States and cities having adequate death-registration systems. At that time not all States had enacted laws requiring death registrations, and in many States the existing laws were poorly enforced. The growth of the registration area is indicated in table 6-1.

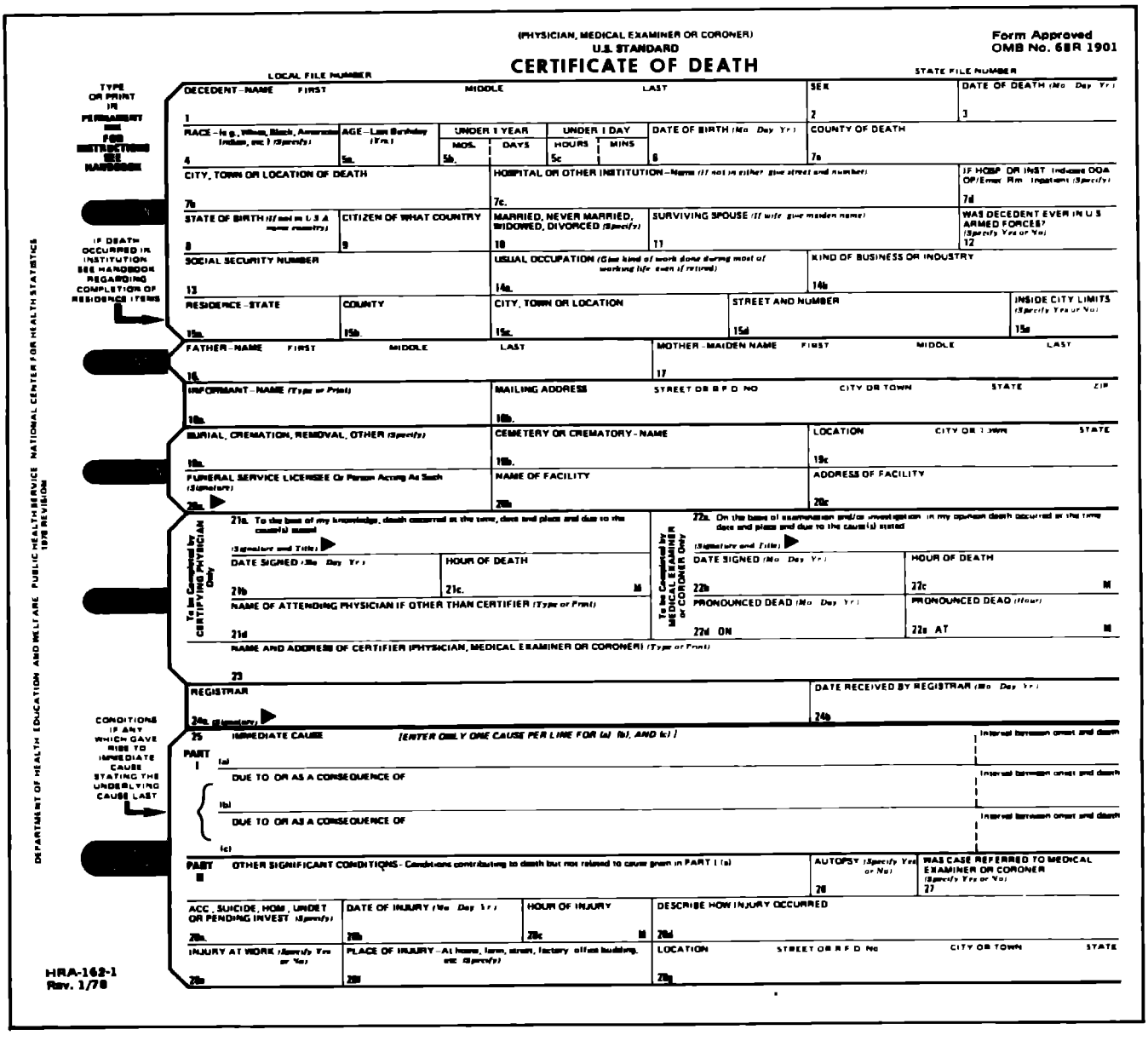
The death-registration area for 1900 consisted of 10 States, the District of Columbia, and a number of cities located in nonregistration States. In 1900 the registration area included 40.5 percent of the population of the continental United States. The original registration area was predominantly urban and was characterized by a high proportion of white persons. If the reporting cities located in nonregistration States are excluded, the population coverage of the death-registration States is much lower, only 26.2 percent of the total population of the United States.

Statistics of fetal deaths (the term "stillbirth" was used for many years) were first published for the birth-registration area in 1918. However, they were not included in the reports issued for the succeeding 3 years. Beginning with 1922, statistics of fetal deaths have been published each year for the birth-registration area.

Table 6-1 presents for each year through 1932 the estimated midyear population of the United States and the estimated midyear population of the birth- and death-registration States. Both registration areas included the entire United States for the first time in 1933.

Before 1940 most of the national mortality tabulations published by the Bureau of the Census were based on data collected from the registration areas. However, beginning with 1940 all published material given in statistical series for the United States before the death-registration area was completed omits data for registration cities located in nonregistration States and includes only statistics for

FIGURE 6 A.



(PHYSICIAN, MEDICAL EXAMINER OR CORONER)

U.S. STANDARD

CERTIFICATE OF DEATH

Form Approved
OMB No. 68R 1901

LOCAL FILE NUMBER

STATE FILE NUMBER

TYPE OR PRINT IN PERMANENT INK FOR INSTRUCTIONS SEE HANDBOOK

IF DEATH OCCURRED IN INSTITUTION SEE HANDBOOK REGARDING COMPLETION OF RESIDENCE ITEMS

DECEDENT - NAME FIRST MIDDLE LAST

1

SEX 2

DATE OF DEATH (Mo Day Yr) 3

RACE - (e.g., White, Black, American Indian, etc.) (Specify) 4

AGE - Last Birthday (Yrs.) 5a.

UNDER 1 YEAR: MOS. 5b.

UNDER 1 DAY: DAYS 5c. HOURS MINS

DATE OF BIRTH (Mo Day Yr) 6

COUNTY OF DEATH 7a

CITY, TOWN OR LOCATION OF DEATH 7b

HOSPITAL OR OTHER INSTITUTION - Name (If not in either give street and number) 7c.

IF HOSP OR INST Indicate OOA OP/Emer Rm Inpatient (Specify) 7d

STATE OF BIRTH (If not in U.S.A. name country) 8

CITIZEN OF WHAT COUNTRY 9

MARRIED, NEVER MARRIED, WIDOWED, DIVORCED (Specify) 10

SURVIVING SPOUSE (If wife give maiden name) 11

WAS DECEDENT EVER IN U.S. ARMED FORCES? (Specify Yes or No) 12

SOCIAL SECURITY NUMBER 13

USUAL OCCUPATION (Give kind of work done during most of working life even if retired) 14a.

KIND OF BUSINESS OR INDUSTRY 14b

RESIDENCE - STATE 15a.

COUNTY 15b.

CITY, TOWN OR LOCATION 15c.

STREET AND NUMBER 15d

INSIDE CITY LIMITS (Specify Yes or No) 15e

FATHER - NAME FIRST MIDDLE LAST 16.

MOTHER - MAIDEN NAME FIRST MIDDLE LAST 17

INFORMANT - NAME (Type or Print) 18a.

MAILING ADDRESS STREET OR R F D NO CITY OR TOWN STATE ZIP 18b.

BURIAL, CREMATION, REMOVAL, OTHER (Specify) 19a.

CEMETERY OR CREMATORY - NAME 19b.

LOCATION CITY OR TOWN STATE 19c

FUNERAL SERVICE LICENSEE Or Person Acting As Such (Signature) 20a.

NAME OF FACILITY 20b

ADDRESS OF FACILITY 20c

To be Completed by CERTIFYING PHYSICIAN Only

21a. To the best of my knowledge, death occurred at the time, date and place and due to the cause(s) stated

(Signature and Title)

DATE SIGNED (Mo Day Yr) 21b

HOUR OF DEATH 21c. M

NAME OF ATTENDING PHYSICIAN IF OTHER THAN CERTIFIER (Type or Print) 21d

To be Completed by MEDICAL EXAMINER or CORONER Only

22a. 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) stated

(Signature and Title)

DATE SIGNED (Mo Day Yr) 22b

HOUR OF DEATH 22c M

PRONOUNCED DEAD (Mo Day Yr) 22d ON

PRONOUNCED DEAD (Hour) 22e AT M

NAME AND ADDRESS OF CERTIFIER (PHYSICIAN, MEDICAL EXAMINER OR CORONER) (Type or Print) 23

REGISTRAR 24a. (Signature)

DATE RECEIVED BY REGISTRAR (Mo Day Yr) 24b

CONDITIONS IF ANY WHICH GAVE RISE TO IMMEDIATE CAUSE STATING THE UNDERLYING CAUSE LAST

25 PART I

IMMEDIATE CAUSE (ENTER ONLY ONE CAUSE PER LINE FOR (a) (b), AND (c).) 1a

Interval between onset and death

DUE TO OR AS A CONSEQUENCE OF 1b

Interval between onset and death

DUE TO OR AS A CONSEQUENCE OF 1c

Interval between onset and death

PART II OTHER SIGNIFICANT CONDITIONS - Conditions contributing to death but not related to cause given in PART I (a) 26

AUTOPSY (Specify Yes or No) 26

WAS CASE REFERRED TO MEDICAL EXAMINER OR CORONER (Specify Yes or No) 27

ACC., SUICIDE, HOM., UNDET OR PENDING INVEST (Specify) 28a.

DATE OF INJURY (Mo Day Yr) 28b

HOUR OF INJURY 28c M

DESCRIBE HOW INJURY OCCURRED 28d

INJURY AT WORK (Specify Yes or No) 28e

PLACE OF INJURY - At home, farm, street, factory, office building, etc. (Specify) 28f

LOCATION STREET OR R F D No CITY OR TOWN STATE 28g

DEPARTMENT OF HEALTH EDUCATION AND WELFARE PUBLIC HEALTH SERVICE NATIONAL CENTER FOR HEALTH STATISTICS 1978 REVISION

HRA-162-1 Rev. 1/78

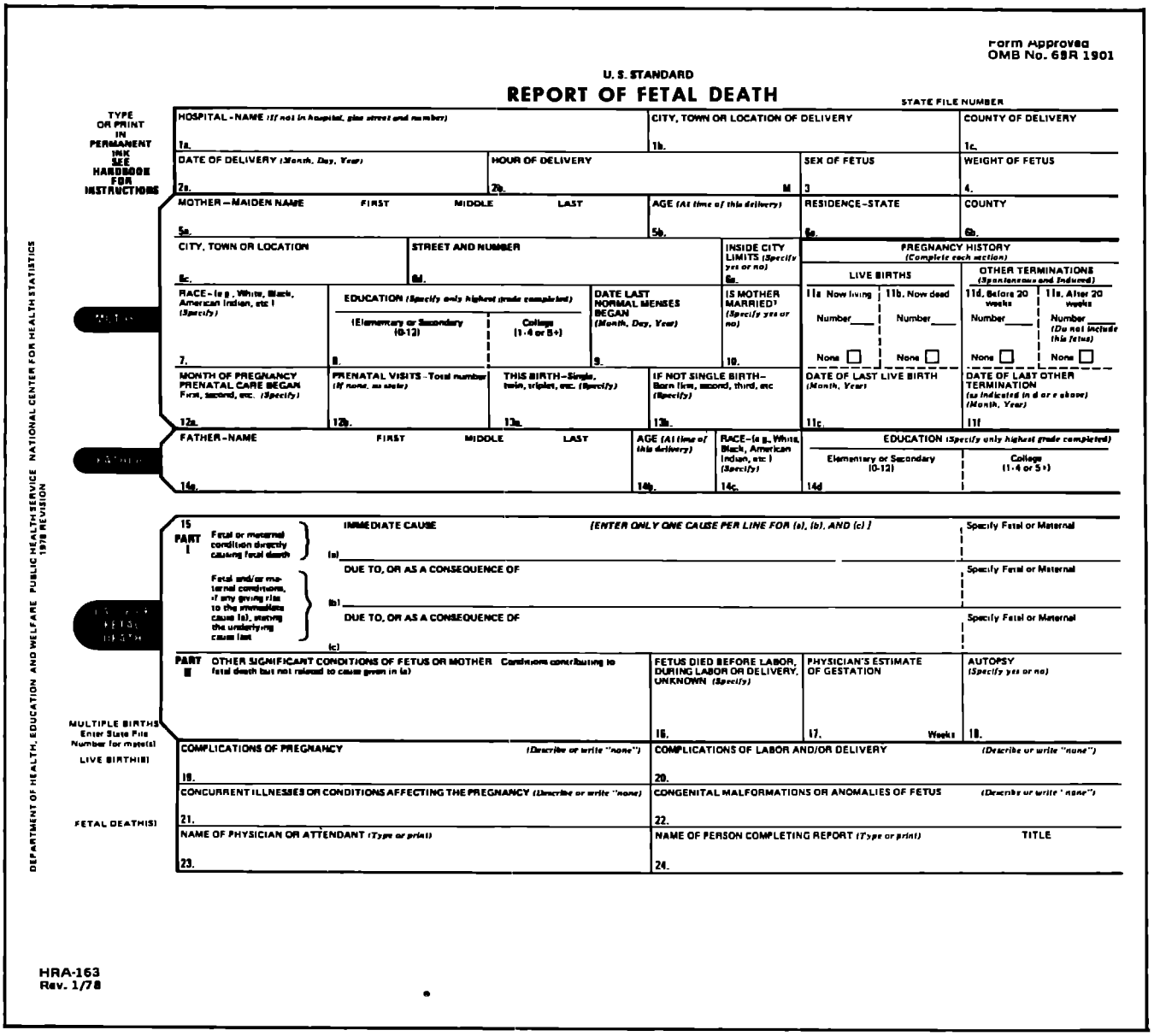
the registration States. This change decreases the mortality statistics coverage of the United States by excluding cities in nonregistration States, but it has advantages in that more reliable population estimates are available for the registration States than for smaller registration areas.

Rates for the expanding group of death-registration States are approximations of rates for the entire Nation, and general comparisons over a long period of time can be made. More exact trends for parts of the United States can be secured by using some constant area such as the original registration States or the registration States in 1920.

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, race, and sex, have been similarly classified and tabulated, differences between the enumeration method of obtaining population data and the registration method

FIGURE 6B.



Form Approved
OMB No. 68R 1901

U. S. STANDARD

REPORT OF FETAL DEATH

STATE FILE NUMBER

TYPE OR PRINT IN PERMANENT INK USE HANDBOOK FOR INSTRUCTIONS

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE PUBLIC HEALTH SERVICE NATIONAL CENTER FOR HEALTH STATISTICS 1978 REVISION

1a. HOSPITAL - NAME (If not in hospital, give street and number)	1b. CITY, TOWN OR LOCATION OF DELIVERY		1c. COUNTY OF DELIVERY
2a. DATE OF DELIVERY (Month, Day, Year)	2b. HOUR OF DELIVERY	3. SEX OF FETUS M	4. WEIGHT OF FETUS
5a. MOTHER - MAIDEN NAME FIRST MIDDLE LAST	5b. AGE (At time of this delivery)	6a. RESIDENCE - STATE	6b. COUNTY
6c. CITY, TOWN OR LOCATION	6d. STREET AND NUMBER	6e. INSIDE CITY LIMITS (Specify yes or no)	PREGNANCY HISTORY (Complete each section)
7. RACE - (e.g., White, Black, American Indian, etc.) (Specify)	8. EDUCATION (Specify only highest grade completed) Elementary or Secondary (0-12) / College (1-4 or 5+)	9. DATE LAST NORMAL MENSES BEGAN (Month, Day, Year)	10. IS MOTHER MARRIED? (Specify yes or no)
12a. MONTH OF PREGNANCY PRENATAL CARE BEGAN First, second, etc. (Specify)	12b. PRENATAL VISITS - Total number (If none, so state)	13a. THIS BIRTH - Single, twin, triplet, etc. (Specify)	13b. IF NOT SINGLE BIRTH - Born first, second, third, etc (Specify)
14a. FATHER - NAME FIRST MIDDLE LAST	14b. AGE (At time of this delivery)	14c. RACE - (e.g., White, Black, American Indian, etc.) (Specify)	14d. EDUCATION (Specify only highest grade completed) Elementary or Secondary (0-12) / College (1-4 or 5+)

PREGNANCY HISTORY

LIVE BIRTHS		OTHER TERMINATIONS (Spontaneous and Induced)	
11a. Now living	11b. Now dead	11d. Before 20 weeks	11e. After 20 weeks
Number____ None ☐	Number____ None ☐	Number____ None ☐	Number (Do not include this fetus) None ☐

11c. DATE OF LAST LIVE BIRTH (Month, Year)	11f. DATE OF LAST OTHER TERMINATION (as indicated in d or e above) (Month, Year)	

15 CAUSE OF FETAL DEATH

PART I — Fetal or maternal condition directly causing fetal death

(a) IMMEDIATE CAUSE (ENTER ONLY ONE CAUSE PER LINE FOR (a), (b), AND (c).) — Specify Fetal or Maternal

Fetal and/or maternal conditions, if any giving rise to the immediate cause (a), 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 Conditions contributing to fetal death but not related to cause given in (a)

16. FETUS DIED BEFORE LABOR, DURING LABOR OR DELIVERY, UNKNOWN (Specify)	17. PHYSICIAN'S ESTIMATE OF GESTATION Weeks	18. AUTOPSY (Specify yes or no)

MULTIPLE BIRTHS Enter State File Number for more(a)

LIVE BIRTH(S)

19. COMPLICATIONS OF PREGNANCY (Describe or write "none")	20. COMPLICATIONS OF LABOR AND/OR DELIVERY (Describe or write "none")

FETAL DEATH(S)

21. CONCURRENT ILLNESSES OR CONDITIONS AFFECTING THE PREGNANCY (Describe or write "none")	22. CONGENITAL MALFORMATIONS OR ANOMALIES OF FETUS (Describe or write "none")
23. NAME OF PHYSICIAN OR ATTENDANT (Type or print)	24. NAME OF PERSON COMPLETING REPORT (Type or print) TITLE

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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 are set forth in two NCHS instruction manuals.[1,2]

Following is a discussion of the classification of certain important items.

Classification by occurrence and residence

Tabulations for the United States and specified geographic areas in this report are 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 United States, with deaths of "nonresidents of the United States" assigned to place of death. "Deaths of nonresidents of the United States" refer 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 possessions of the United States. Beginning with 1970, deaths of nonresidents of the United States are not included in tables by place of residence.

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[1]National Center for Health Statistics: Vital statistics, classification and coding instructions for fetal-death records, 1978. *NCHS Instruction Manual*, Part 3b. Public Health Service. Hyattsville, Md., Nov. 1977.

[2]National Center for Health Statistics: Vital Statistics, demographic classification and coding instructions for death records, 1978. *NCHS Instruction Manual*, Part 4. Public Health Service. Hyattsville, Md., Nov. 1977.

Tables by place of occurrence, on the other hand, include both deaths of residents and nonresidents of the United States. Consequently, for each year during 1970-78, the total number of deaths in the United States by place of occurrence is somewhat greater than the total by place of residence. For 1978 this difference amounts to 2,839 deaths.

Mortality statistics by place of occurrence are shown in tables 1-10, 1-19, 1-20, 1-30, 3-1, 3-8, 7-1, and 7-7.

Before 1970, except for the years 1964 and 1965, deaths of nonresidents of the United States occurring in the United States have been 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 show 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.[3]

A comparision of the results of this study of deaths with those for a previous matched record study of births[4] shows that considerable improvement in the quality of residence data had taken place since 1950. The results were the same—an overstatement of events in urban areas by NCHS compared 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. Two factors contribute to this difference in magnitude. The first factor is an item that was added to the Standard Certificate of Death in 1956, asking if residence is inside or outside city limits. This new item aided in properly allocating the residence of persons living near cities but outside the corporate limits. The second factor is that there is more likelihood of movement for hospital utilization for births than for deaths.

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.

The geographic codes assigned by the National Center for Health Statistics during data reduction of source information on birth, death, and fetal-death records are given in an NCHS instruction manual.[5]

Standard metropolitan statistical areas.—Except in the New England States, a standard metropolitan statistical area (SMSA) is a county or a group of contiguous counties containing at least one city of 50,000 inhabitants or more or "twin cities" with a combined population of at least 50,000 in the 1970 census. In addition to the county or counties containing such a city or cities, contiguous counties are included in an SMSA if, according to specified criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city or cities.[6]

In New England the U.S. Office of Management and Budget uses towns and cities rather than counties as geographic components of SMSA's. The National Center for Health Statistics cannot use the SMSA classification for these States because its data are not coded to identify all towns. Instead, the metropolitan State economic area (MSEA) established by the U.S. Bureau of the Census, which is made up of county units, is used.[7]

For tables 7-4 and 7-8 in this report, the SMSA's and their component counties are those established by the U.S. Office of Management and Budget as of 1970 (except in the New England States) and used by the U.S. Bureau of the Census.

Tables 1-18 and 2-8, however, are limited to the 50 largest SMSA's and MSEA's (in the New England States) established by the Office of Federal Statistical Policy and Standards for 1978. These 50 largest units for 1978 are different from those for 1977.

The list of 50 largest units for 1978 also differs from the list for 1970. Moreover, the county components for some of the SMSA's and MSEA's that appear on both lists are different for 1978 from the components for 1970.

As a result, sometimes the number of deaths shown for the same-named SMSA or MSEA in tables

[3]National Center for Health Statistics: Comparison of the classification of place of residence on death certificates and matching census records, United States, May-August 1960, by M. A. McCarthy. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 2-No. 30. Public Health Service. Washington. U.S. Government Printing Office, Jan. 1969.

[4]National Vital Statistics Division: Matched record comparison of birth certificate and census information, United States, 1950, *Vital Statistics–Special Reports*, Vol. 47, No. 12. Public Health Service. Washington, D.C., Mar. 1962.

[5]National Center for Health Statistics: Vital statistics, vital records geographic classification, 1970. *NCHS Instruction Manual*, Part 8. Health Resources Administration. Rockville, Md., 1975.

[6]For a more complete discussion see U.S. Bureau of the Census, *U.S. Census of Population, 1970, Number of Inhabitants*, Final Report, PC(1)-A1, United States Summary, Washington. U.S. Government Printing Office, 1971, and U.S. Bureau of the Budget, *Standard Metropolitan Statistical Areas*, Washington. U.S. Government Printing Office, 1967.

[7]For discussion of MSEA's, see U.S. Bureau of the Census, *State Economic Areas*, Washington. U.S. Government Printing Office, 1951, and the first reference cited in footnote 6.

7-4 and 7-8 based on units established for 1970 will differ from the number of deaths shown in tables 1-18 and 2-8 based on units established for 1978.

Standard consolidated areas.—For the metropolitan complexes around New York and Chicago, several contiguous SMSA's and additional counties that do not appear to meet the formal integration criteria for SMSA's but do have strong interrelationships of other kinds have been combined into the New York-Northeastern New Jersey and the Chicago-Northwestern Indiana Standard Consolidated Areas.[8]

Metropolitan and nonmetropolitan counties.—Counties included in SMSA's or in New England MSEA's for 1970 are called metropolitan counties; all other counties are classified as nonmetropolitan.

Population-size groups (formerly "urban" and "rural" areas).—Vital statistics data for cities and certain other urban places in 1978 are classified according to the population enumerated in the 1970 Census of Population. In this report "Population-size groups" refer to two groups, "Urban places" and "Balance of area." "Urban places" consist of the following places:

1. Each incorporated city and other urban places of 10,000 inhabitants or more.
2. Each town in New England and each township in 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 1,500 persons or more per square mile.
3. Each county in States other than the New England States, New Jersey, and Pennsylvania that had no incorporated municipality within its boundary and had a density of 1,500 persons or more per square mile. (Arlington County, Virginia, is the only county classified as urban under this rule.)

"Balance of area" consists of all other places.

Before 1964, places were classified as "urban" or "rural." The Technical Appendixes for earlier years discuss the previous classification system.

Age

The age recorded on the death record is the age at last birthday. With respect to the computation of death rates, the age classification used by the U.S. Bureau of the Census is also based on the age of the person in completed years.

Race and color

For vital statistics in the United States in 1978, deaths are classified by race—white, black, Indian, Chinese, Japanese, and other races.

The white category includes, in addition to persons reported as white, those reported as Mexican, Puerto Rican, Cuban, and all other Caucasians. The Indian category includes American, Alaskan, Canadian, 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 other 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 in use for each year of the period 1969-78. Before 1969 if the entry for race was a mixture of black and any other race except Hawaiian, the entry was coded to black.

Most of the tables in this report, however, do not show data for this extended classification by race. In some tables the divisions are white, black, and other. In other tables, where the main purpose is to isolate the major group, the classifications are simply white and all other.

Race not stated.—For 1978 the number of death records for which the race was not stated was 1,756, or 0.1 percent of the total deaths. Death records with race entry not stated were assigned to a racial designation as follows: If the preceding record were coded white, the code assignment is made to white; if the code is other than white, the assignment is made to black. For years 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 use 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 or color for 1962 and 1963 exclude New Jersey. For 1964, 6.8 percent of the death records in use for residents of New Jersey did not contain the race item.

Adjustments made in vital statistics to take into account 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.

Fetal deaths

In May 1950 the World Health Organization recommended the adoption for international use of the definition of fetal death as "death prior to the

[8]See footnote 6.

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

Shortly thereafter this definition of fetal death was adopted by the National Center for Health Statistics as the nationally recommended standard. Currently, of the 55 registration areas (including the 50 States, the District of Columbia, New York City, Guam, Puerto Rico, and the Virgin Islands), a total of 40 registration areas uses this definition. Of the remaining 15 areas, 14 use a shortened definition, and 1 (Puerto Rico) has no formal definition.[10]

As another step toward increasing the comparability of data on fetal deaths for different countries, the World Health Organization recommended that in classifying fetal deaths for statistical purposes they be grouped 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

Note that in table 3-13, group IV consists of fetal deaths with gestation not stated but presumed to be 20 weeks or more gestation.

Until 1939 the nationally recommended procedure for registration of a fetal death required the filing of both a live-birth 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, 1955, 1956, and 1968. In 1978 the Standard Certificate of Fetal Death was replaced by the Standard Report of Fetal Death (figure 6-B).

The 1977 revision of the *Model State Vital Statistics Act and Model State Vital Statistics Regulations*,[11] implemented in 1978, recommended that spontaneous fetal deaths of 20 weeks or more gestation and all induced terminations of pregnancy regardless of gestational age be reported and further that they be reported on separate forms. These forms are to be considered legally-required statistical reports rather than legal documents.

Because the health implications are different for spontaneous fetal deaths and induced terminations of pregnancy, and because the National Center for Health Statistics began receiving increasing numbers of reports on induced terminations of pregnancy, beginning with 1970 fetal deaths, procedures were implemented that attempted to separate reports on spontaneous fetal deaths from those on induced terminations of pregnancy, based on reported information on each report. These procedures are still in use.

Comparability and completeness of data.—State requirements for registration of fetal deaths vary. Most of the States require registration of fetal deaths of gestations of 20 weeks or more. Table 3-1 in section 3 shows the minimum period of gestation required by each State for fetal-death registration. There is substantial evidence that not all fetal deaths for which registration is required are reported.[12]

Underregistration is more of a problem near the lower limit for States having a minimum gestation period requirement. Failure to register fetal deaths near the lower limit results to a large degree from underestimating the gestation period. This is illustrated by the fact that for areas requiring registration of all fetal deaths, the total number reported for 20-23 weeks is higher than the numbers reported for 24-27 and 28-31 weeks. For most of the other areas, however, the opposite is true.

To maximize the comparability of data by year and by State, most of the tables in section 3 are based on fetal deaths occurring at gestations of 20 weeks or more. These tables also include fetal deaths of not stated or unknown gestation for those States requiring registration at 20 weeks or more only. Beginning with 1969, fetal deaths of not stated gestation were excluded for States requiring registration of all

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[9]National Office of Vital Statistics: *International Recommendations on Definitions of Live Birth and Fetal Death*. PHS Pub. No. 39. Public Health Service. Washington. U.S. Government Printing Office, Oct. 1950.

[10]For definitions used by the States and registration areas, see National Center for Health Statistics, *State Definitions and Reporting Requirements for Live Births, Fetal Deaths, and Induced Terminations of Pregnancy*. PHS Pub. No. (PHS) 81-1119. Public Health Service. Washington. U.S. Government Printing Office, May 1981.

[11]National Center for Health Statistics, *Model State Vital Statistics Act and Model State Vital Statistics Regulations*. PHS Pub. No. (PHS) 78-1115. Public Health Service. Washington. U.S. Government Printing Office, May 1978.

[12]Unpublished fetal mortality data contained in a thesis for Harvard School of Public Health, Apr. 1962, by Carl L. Erhardt, Sc.D., Director, Bureau of Records and Statistics, Department of Health, New York, N.Y.

products of conception except for those with a stated birth weight of 500 grams or more. In 1978 this rule was applied to the following States: Colorado, Georgia, Hawaii, New York, Rhode Island, and Virginia. Each year there are some exceptions to this procedure. In 1978 Arkansas was one such exception; this State required the reporting of fetal deaths of all periods of gestation in 1978; however, all fetal deaths of not stated gestation were assumed to be of 20 weeks or more gestation.

The data in table 3-3 include only fetal deaths to residents of those areas in the United States which report all periods of gestation. The areas are Arkansas, Colorado, Georgia, Hawaii, New York, Rhode Island, and Virginia. However, Arkansas is excluded from this table because of individual reporting problems explained below. None of these reporting problems, however, should appreciably affect the data for fetal deaths of 20 weeks or more gestation.

In States requiring the reporting of fetal deaths of all periods of gestation, generally at least half of the reported fetal deaths are less than 20 weeks gestation. Only 8.5 percent of all fetal deaths reported for Arkansas in 1978 were of less than 20 weeks gestation. Beginning with data year 1971, Arkansas introduced a form for confidential reporting of abortions. It is believed that most spontaneous fetal deaths of under 20 weeks gestation are reported on this form and not on the fetal-death certificate. The National Center for Health Statistics only receives fetal-death certificates from Arkansas.

Some liveborn infants who die shortly after birth, particularly those born prematurely who die before the umbilical cord is severed or while the placenta is still attached, may be erroneously reported as fetal deaths. This type of error may be more of a problem in States lacking a precise definition of fetal deaths.

Georgia.—Beginning with data year 1975, fetal deaths occurring in Georgia are reported only to the State and county level. This affects the figures concerning fetal deaths in tables 3-6, 7-1, and 7-2. In tables 3-6 and 7-2 all fetal deaths occurring in Georgia are assigned to "Balance of area" and not to "Urban places." Consequently, reported fetal deaths and fetal-death ratios for the United States and Georgia for "Urban Areas" are lower than they would be if needed residence information were available for fetal deaths occurring in Georgia. Also, the figures for "Balance of area" are higher than they would be if this same information were available. In table 7-1 all fetal deaths occurring in Georgia are assigned to "Balance of county" and not to specified urban places. Fetal deaths that are assigned to specified urban places are those occurring outside of Georgia to residents of Georgia.

Maine—Beginning with data year 1978, Maine changed its reporting requirements for spontaneous fetal deaths from "all periods of gestation" to "20 weeks or more." This change affected the tabulation of fetal deaths with not stated gestational age, including trend data in table 3-7. Whereas data for 1974-77 includes fetal deaths of not stated gestational age only if birth weight was stated as 500 grams or more, data in 1978 include all fetal deaths of not stated gestational age.

Period of gestation.—The period of gestation is the number of completed weeks elapsed between the first day of the last menstrual period and the date of delivery, irrespective of whether the product of conception was liveborn or born without evidence of life. The first day of the last normal menstrual period (LMP) is used as the initial date since 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 the calculated gestation falls beyond a duration considered biologically plausible, "gestation in weeks" or "Physician's estimate of gestation" is used. When the period of gestation is reported in months on the certificate, it is allocated to gestation 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

In 1978 the areas using LMP were as follows:

Alabama	Kentucky	North Carolina
Alaska	Louisiana	North Dakota
Arizona	Maine	Ohio
California	Maryland	Oklahoma
Colorado	Massachusetts	Oregon
District of Columbia	Michigan	Rhode Island
	Minnesota	South Carolina
Florida	Mississippi	South Dakota
Georgia	Missouri	Tennessee
Hawaii	Montana	Utah
Idaho	Nebraska	Vermont
Illinois	Nevada	Washington
Indiana	New Hampshire	West Virginia
Iowa	New Jersey	Wyoming
Kansas	New York	

Birth weight.—Of the 55 registration areas (including the 50 States, the District of Columbia, New York City, Guam, Puerto Rico, and the Virgin Islands), 26 do not specify how weight should be given; 16 specified that weight should be given in pounds and ounces; 6 specified grams; and the re-

maining 7 areas specified weight should be given either in pounds and ounces or in grams.

In tabulating and presenting these data, the metric system (grams) has been used to facilitate comparison with other data published in the United States and internationally. The equivalents of the gram intervals in pounds and ounces are as follows:

500 grams or less	=	1 lb	1 oz or less			
501 - 1,000 grams	=	1 lb	2 oz	-	2 lb	3 oz
1,001 - 1,500 grams	=	2 lb	4 oz	-	3 lb	4 oz
1,501 - 2,000 grams	=	3 lb	5 oz	-	4 lb	6 oz
2,001 - 2,500 grams	=	4 lb	7 oz	-	5 lb	8 oz
2,501 - 3,000 grams	=	5 lb	9 oz	-	6 lb	9 oz
3,001 - 3,500 grams	=	6 lb	10 oz	-	7 lb	11 oz
3,501 - 4,000 grams	=	7 lb	12 oz	-	8 lb	13 oz
4,001 - 4,500 grams	=	8 lb	14 oz	-	9 lb	14 oz
4,501 - 5,000 grams	=	9 lb	15 oz	-	11 lb	0 oz
5,001 grams or more	=	11 lb	1 oz or more			

Race and color.—The race of the fetus is ordinarily classified to the race of the parents. If the parents are of different races, the following rules apply: (1) When only one parent is white, the fetus is assigned the other parent's race. (2) When neither parent is white, the fetus is assigned the father's race with one exception: If the mother is Hawaiian or Part-Hawaiian, the fetus is classified as Hawaiian.

When the race of one parent is missing or ill-defined, the race of the other determines that of the fetus. When race of both parents is missing, the race of the fetus is allocated to the specific race of the fetus on the preceding record.

Total-birth order.—The number of a live birth or a fetal death in the total birth order is the sum of the live births and fetal deaths which a mother has had including the birth being recorded. For example, if a mother has previously given birth to two live babies and to one born dead, the next event to occur, whether a live birth or fetal death, is counted as number four in the total-birth order.

In the 1978 revision of the Standard Report of Fetal Death, total birth order is calculated from four items on pregnancy history: number of previous live births, now living; number of previous live births, now dead; number of other terminations (include both spontaneous fetal deaths and induced terminations of pregnancy) before 20 weeks; and number of other terminations (include both spontaneous fetal deaths and induced terminations) after 20 weeks. Of the 55 registration areas (including the 50 States, the District of Columbia, New York City, Guam, Puerto Rico, and the Virgin Islands), 29 areas have adopted the 4 standard items on pregnancy history. These areas are

Alabama
Arizona[a]
California
Hawaii
Idaho
Indiana
Iowa
Kansas
Kentucky
Maine[a]
Massachusetts
Mississippi
Missouri
Montana
Nebraska
Nevada[a]
New Hampshire[a]
New York City
North Dakota
Ohio
Oregon
Rhode Island
South Carolina
South Dakota
Tennessee
Utah
Wisconsin
Wyoming
Guam

Twenty areas have information on the number of previous live births, now living; number of previous live births, now dead; and number of previous fetal deaths any time after conception. Four areas request information on the number of previous live births, now living; number of previous live births, now dead; and number of previous fetal deaths; these areas also specify a gestational age for including information on previous fetal deaths. These 24 areas are

Alaska
Arkansas
Connecticut
Delaware
District of Columbia[b]
Florida
Georgia
Illinois
Louisiana
Maryland
Michigan
Minnesota
New Jersey
New Mexico
North Carolina
Oklahoma
Pennsylvania[b]
Texas[b]
Vermont[b]
Virginia
Washington
West Virginia
Puerto Rico
Virgin Islands

Two areas (Colorado and New York State) ask for information on number of previous live births, now living; number of previous live births, now dead; and number of other terminations, spontaneous and induced. Total birth order for all 55 areas is calculated from the sum of the available information. Thus information on total birth order may not be completely comparable for all 55 registration areas.

Marital status.—Table 3-4 shows fetal deaths by marital status. Only fetal deaths to residents of States which provided for reporting this item on both their certificates of live birth and fetal death in 1978

[a]These areas changed their forms during 1978 but after January 1, 1978.

[b]These areas specify a gestational age for the inclusion of previous fetal deaths.

are included. The following States are considered as reporting States:

Alabama	Kentucky	Oregon
Alaska	Louisiana	Pennsylvania
Arizona	Maine	Rhode Island
Colorado	Massachusetts	South Carolina
Delaware	Minnesota	South Dakota
District of Columbia	Mississippi	Tennessee
Florida	Missouri	Utah
Hawaii	Nebraska	Virginia
Idaho	New Hampshire	Washington
Illinois	New Jersey	West Virginia
Indiana	North Carolina	Wisconsin
Iowa	North Dakota	Wyoming
Kansas	Oklahoma	

There are no quantitative data on the characteristics of unmarried women who may misreport their marital status or who fail to register fetal deaths. Underregistration may be greater for the unmarried group than for the married group.

Age of mother.—The fetal-death certificate asks for the mother's "age (at time of delivery)," and the ages are edited in NCHS for upper and lower limits. When mothers are reported to be under 10 years of age or age 50 years 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 allocated according to the age appearing on the record previously processed for a mother of identical color and having the same total-birth order (total of fetal deaths and live births).

Cause of death

Beginning with data year 1968 the cause-of-death statistics published by the National Center for Health Statistics have been classified in accordance with the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States* (ICDA),[13] which is based on the 1965 Revision of the International Classification of Diseases (ICD).[14] The ICDA gives greater detail and specificity in some categories than is provided by the Eighth Revision of the ICD. Complete correspondence between these two classifications was maintained at the three-digit level, but new four-digit subdivisions were created in various parts of the ICDA. Where necessary, existing four-digit subdivisions are renumbered to accommodate the additional subcategories in logical sequence. In the ICDA, subdivisions which do not correspond exactly with the ICD are identified by asterisks. In this report the four-digit subcategory numbers which differ from those in the ICD are also shown with asterisks.

In addition to specifying that the Classification be used, the World Health Organization recommended special lists for mortality tabulations—the Detailed List, consisting of all three-digit categories; List A, the List of 150 Causes for Tabulation of Morbidity and Mortality; List B, the List of 50 Causes for Tabulation of Mortality; and List P, the List of 100 Causes for Tabulation of Perinatal Morbidity and Mortality. The recommended tabulation lists have been modified for use in the National Center for Health Statistics.

The Each-Cause List is made up of each three-digit category of the Detailed List to which deaths may be assigned and each four-digit subcategory of the ICDA to which deaths may be assigned. For category 412 the fourth digits .1, .2, .3, and .4 are used instead of the fourth digits .0 and .9 which appear in the ICDA. The each-cause table (1-23) does not show the fourth-digit subcategories provided for Motor vehicle accidents (E810-E823). However, these subcategories, which identify persons injured, are shown in the accident tables (Section 4). Special fifth-digit subcategories are also used in the accident tables to identify place of accident when deaths from nontransport accidents are shown.

The List of 281 Selected Causes of Death is an extension of List A, designed so that with one exception the original groups can be obtained by combining titles. The individual titles in List A for Certain causes of mortality in early infancy are shown as one group title in tables using the List of 281 Selected Causes. The individual categories are shown in the tables using the List of 65 Selected Causes of Infant Death, which was created by extending some titles in List P and by combining others. Titles in List P not shown in this list may be found in the each-cause table except for causes of death in List P that are applicable only to fetal deaths.

The List of 69 Selected Causes of Death is an extension of List B; however, certain causes of low frequency in the United States are not shown separately. These causes are Cholera, Typhoid fever, Plague, Diphtheria, Smallpox, Typhus and other rickettsioses, and Malaria.

The List of 34 Selected Causes of Death for Detailed Geographic Areas was created by combining titles in the List of 69 Selected Causes.

These lists were designed to be as comparable as possible to the NCHS lists most recently in use under the Seventh Revision. In several instances this could

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[13] National Center for Health Statistics: *Eighth Revision International Classification of Diseases, Adapted for Use in the United States.* PHS Pub. No. 1693. Public Health Service. Washington. U.S. Government Printing Office, 1967.

[14] World Health Organization: *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death,* Based on the Recommendations of the Eighth Revision Conference, 1965. Geneva. World Health Organization, 1967.

not be done. No attempt will be made here to enumerate these changes. However, the following changes are especially worth noting. The group title Major cardiovascular diseases (ICDA Nos. 390-448) includes all of the titles in "Section VII. Diseases of the circulatory system" of the Eighth Revision except Diseases of veins and lymphatics and other diseases of circulatory system (ICDA Nos. 450-458). The most nearly comparable group title in the Seventh Revision is Diseases of cardiovascular system (ICD Nos. 330-334, 400-468).

Both of these group titles include the first and third leading causes of death—Diseases of heart (ICDA Nos. 390-398, 402, 404, 410-429) and Cerebrovascular diseases (ICDA Nos. 430-438). They both also include Diseases of arteries, arterioles, and capillaries (ICDA Nos. 440-448). The comparable title in the Seventh Revision for these latter diseases is Diseases of arteries (ICD Nos. 450-456). But the group title Diseases of cardiovascular system (ICD Nos. 330-334, 400-468) in the Seventh Revision includes also the title Diseases of veins and other diseases of circulatory system (ICD Nos. 460-468). These diseases of veins and other diseases of circulatory system (assigned by the Eighth Revision to ICDA Nos. 450-458) are not included, however, under the Eighth Revision group title Major cardiovascular diseases (ICDA Nos. 390-448).

Effect of decennial list revisions.—The International Lists, in use in this country since 1900, have been revised decennially so that the disease classification may be consistent with advances in medical science and changes in diagnostic practice. Each decennial revision of the International Lists has produced some break in comparability of cause-of-death statistics. For the first five revisions, the continuity in the mortality trends is not considered a problem of great concern. Van Buren described some of the major shifts in the cause-of-death statistics up to the Fifth Revision (1938) due to changes in the classification of causes of death.[15] Dunn and Shackley measured the change in mortality statistics by cause due to the Fifth Revision.[16]

This was done by coding mortality records for 1940 by the 1929 and 1938 revisions. The results of the study have been useful in evaluating the effects of the Fifth Revision and changes in the joint-cause selection procedure.

Sixth Revision.—The Sixth Revision of the International Lists of Diseases and Causes of Death was adopted by the World Health Organization in July 1948 and used for mortality data in the United States from 1949 through 1957. This revision represented a more sweeping change than any previous revision. The classification scheme was expanded considerably to provide specific categories for nonfatal diseases and injuries in order to provide a classification which could be used for coding morbidity as well as mortality records.

In addition to the expanded scope of the Sixth Revision of the International Classification, there was a major change in the method of selection of the cause of death for primary tabulation. A large proportion of death certificates filed annually in the United States reports two or more diseases or conditions as causes of death. General statistical practice requires that cases involving more than one cause of death be assigned to a single cause, making it necessary to select the one cause to which the death will be assigned. The method of selection has an important effect upon the resulting statistics.

In 1948 the World Health Assembly adopted, along with the Sixth Revision of the International Lists, a form of medical certification and rules for classification of the underlying cause of death for international use. The form of medical certification in the Standard Certificate of Death is shown in figure 6-A. It is designed to facilitate the selection of the underlying cause of death when two or more causes are recorded. In general, if the certification is completed properly, the underlying cause of death entered by the physician is the cause to be tabulated. This procedure, used in the United States beginning with deaths in 1949, differs markedly from that used in previous years. Formerly, definite priority relationships were set up for combinations of causes reported on the death certificate. The single cause to be tabulated was chosen according to these fixed rules.

Comparability between the Sixth and Fifth Revisions.—To maintain a time series of mortality rates for comparable causes, the International Conference for the Sixth Revision of the International Lists recommended that deaths for a country as a whole in 1949 and 1950 be coded according to both the Sixth and Fifth Revisions. In the United States, 1950 mortality data were used for the dual coding. The differences resulting from the use of the two revisions are expressed by a factor termed the comparability ratio. This is the number of deaths assigned to a particular cause under the Sixth Revision divided

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[15] U.S. Bureau of the Census: Some things you can't prove by mortality statistics, by G. H. Van Buren. *Vital Statistics—Special Reports*, Vol. 12, No. 13. Washington, D.C., Jan. 1940.

[16] U.S. Bureau of the Census: Comparison of cause-of-death assignments by the 1929 and 1938 Revisions of the International Lists, deaths in the United States, 1940, by H. L. Dunn and W. Shackley. *Vital Statistics—Special Reports*, Vol. 19, No. 14. Washington, D.C., June 1944.

by the number of deaths assigned to that cause using the Fifth Revision.[17,18]

Seventh Revision.—Changes in the Seventh Revision were held to a minimum because of the relatively short experience with the Sixth Revision. In compliance with a recommendation of the Expert Committee on Health Statistics, the changes were limited to essential ones and amendments of errors and inconsistencies. Provisions previously contained in an addendum[19] were integrated into the manual.[20] Since these provisions had been used with the Sixth Revision, they did not represent classification changes. The only change made in three-digit categories consisted of rewording a few titles. In a few cases the rewording included redefining morbid conditions classifiable to these categories and transferring certain terms from one category to another. The three-digit categories which were affected are listed in Section 1, Volume I, of *Vital Statistics of the United States, 1958.* There were also a number of changes in four-digit subcategories, consisting mostly of the addition of subdivisions to provide more detailed classification of malignant neoplasms of specified sites. The three-digit categories for which there were additions, deletions, or changes in the four-digit subcategories are also listed in section 1 of the 1958 report.

The international rules for selecting the cause of death for primary mortality classification were recast for use with the Seventh Revision to simplify them and to organize them from the viewpoint of the coder making the cause-of-death assignment. The intent of the rules remains the same, that is, to code the cause which the medical certifier judged to be the underlying cause starting the train of events leading directly to death. In recasting the rules, some interpretations were modified—mainly those involving selection of the underlying cause for improperly completed certifications. In adapting coding procedures to reporting practices in the United States, some additional changes in interpretations were made.

In the majority of cases, application of the rules for the Sixth and Seventh Revisions resulted in the same code assignment. There were some differences in individual assignments affecting a number of categories. Many of these individual assignments were compensatory and resulted in no detectable discontinuity of trends for various causes of death; the comparability of a number of categories was affected to a limited extent.

Comparability between the Seventh and Sixth Revisions.—To estimate the magnitude of the effect of the Seventh Revision upon the comparability of mortality trends for various causes, a 10-percent sample of deaths in 1958 was classified using both the Sixth and Seventh Revisions. The comparability ratios for selected causes and a discussion of the results of this study are published in "Comparability of Mortality Statistics for the Sixth and Seventh Revisions, United States, 1958."[21]

Eighth Revision.—The Eighth Revision contains major modifications in several sections of the lists. Also, the international rules for selecting the underlying cause have been simplified. In addition, changes have been introduced in the special rules and decisions which adapt the coding procedures to reporting practices in the United States.

The Detailed List of the Eighth Revision consists of 671 categories of diseases and morbid conditions, 182 categories for classification of the external cause of injury, and 187 categories for characterization of injuries according to the nature of the lesion. These detailed categories are designated by three-digit numbers. There are also four-digit subcategories in the ICDA that provide further specificity or more information regarding etiology or manifestations of the disease. The classification is arranged in 17 main sections, or chapters. The important changes are summarized for each of these sections in the introduction to the ICDA, pages xxiv-xxviii. Following are some of the many changes made:

Infective and parasitic diseases.—In the Seventh Revision, list titles for diarrheal conditions were scattered over several sections of the classification. In the Eighth Revision all the Seventh Revision subdivisions for these conditions, including

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[17]National Center for Health Statistics: Comparability of mortality statistics for the Fifth and Sixth Revisions, United States, 1950, by M. M. Faust and A. B. Dolman. *Vital Statistics–Special Reports,* Vol. 51, No. 2. Public Health Service. Washington, D.C., Dec. 1963.

[18]National Center for Health Statistics: Comparability ratios based on mortality statistics for the Fifth and Sixth Revisions, United States, 1959, by M. M. Faust and A. B. Dolman. *Vital Statistics–Special Reports,* Vol. 51, No. 3. Public Health Service. Washington, D.C., Feb. 1964.

[19]World Health Organization: *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death,* Addendum 1, *Supplementary Interpretations and Instructions for Coding Causes of Death.* Geneva. World Health Organization, 1953.

[20]World Health Organization: *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death,* Based on the Recommendations of the Seventh Revision Conference, 1955. Geneva. World Health Organization, 1957.

[21]National Center for Health Statistics: Comparability of mortality statistics for the Sixth and Seventh Revisions, United States, 1958, by M. M. Faust and A. B. Dolman. *Vital Statistics–Special Reports,* Vol. 51, No. 4. Public Health Service. Washington, D.C., Mar. 1965.

those for infants, are brought together under one category, Diarrheal diseases (009).

Diseases of the nervous system and sense organs.—Vascular lesions affecting central nervous system (330-334) in the Seventh Revision has been transferred in the Eighth Revision to "Section VII, Diseases of the circulatory system," where they appear as Cerebrovascular diseases (430-438).

Certain causes of perinatal morbidity and mortality.—This section represents an integration of "Section XV, Certain diseases of early infancy" and Classification of causes of stillbirth (Y30-Y39) in the Seventh Revision. The age qualifications used in previous revisions to classify the same conditions in or outside this section have been deleted. For example, Pneumonia of newborn (763) of the Seventh Revision is no longer in this section. Instead, it is included in the Eighth Revision with Pneumonia (480-486), to which pneumonias are assigned without regard to age.

Accidents, poisonings, and violence.—A new subsection (E980-E989) has been introduced for the classification of deaths where it was not possible for the certifier to determine whether the injuries were accidentally or purposely inflicted.

Comparability between the Eighth and Seventh Revisions.—To measure the degree of discontinuity in cause-of-death statistics resulting from the introduction of the Eighth Revision, provisional estimates of selected comparability ratios based on dual coding of a stratified sample of 1966 death certificates by the Seventh and Eighth Revisions of the International Classification of Diseases were computed. These ratios appear in the *Monthly Vital Statistics Report* of the National Center for Health Statistics, Volume 17, Number 8, Supplement; and in Comparability of Mortality Statistics for the Seventh and Eighth Revisions of the International Classification of Diseases, United States, *Vital and Health Statistics*, Series 2, No. 66, DHEW Pub. No. (HRA) 76-1340.

Significant coding changes during the Eighth Revision.—Since 1968 the use of an automated system for obtaining the underlying cause requires special coding procedures in NCHS. (See Quality control procedures under Quality of Data.) The automated system was designed to assign the underlying cause according to the international rules just as if a manual process were to be used.

Beginning with 1969 a special four-digit subcategory, Chronic obstructive lung disease (*519.3), has been added to obtain the number of certificates on which medical certifiers have entered this more general term rather than a more specific diagnosis of chronic bronchitis, emphysema, or asthma. The number of certificates assigned to (*519.3) increased from 2,704 for 1969 to 28,613 for 1978. It is necessary to add together the number of deaths assigned to this new four-digit category and the number of deaths assigned to Bronchitis, emphysema, and asthma (ICDA Nos. 490-493) to obtain a measure of mortality from all chronic obstructive lung diseases.

To provide that deaths would not be assigned to Chronic obstructive lung disease (*519.3) if a more specific diagnosis such as chronic bronchitis, emphysema, or asthma also appeared on the death certificate, the coding procedures were updated for 1971 and 1972 data years in accordance with the following linkages:

*519.3	Chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema

Excludes conditions in *519.3 *with* conditions in:

490	Bronchitis (491) (Chronic bronchitis)
491	(Chronic bronchitis) (491)
492	(Emphysema) (492)
493	(Asthma) (493)

But the limitation imposed by these linkage provisions did not alter the upward trend in the number of deaths assigned to Chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema (*519.3). The number of deaths assigned to (*519.3) increased from 6,321 for 1971 to 8,210 for 1972.

Under the Eighth Revision of the ICDA, deaths assigned to chronic obstructive lung disease or chronic obstructive pulmonary disease were assigned to Other diseases of lung (ICDA No. 519.2). Despite the transfer of these deaths from this category to the new category Chronic obstructive lung disease (No. *519.3), the number of deaths assigned to Other diseases of lung (ICDA No. 519.2) also continued to increase—from 1,306 deaths for 1969 to 2,318 for 1978.

Also beginning with 1971 a special four-digit subcategory (*E854.8) has been added to identify Acute narcotism, not otherwise specified, whether or not the circumstances were undetermined. Also, a preference will be given to Drug dependence (ICDA No. 304) when a statement of drug dependence or a synonymous term appears on the certificate with mention of poisoning by certain addictive drugs.

In addition, beginning with 1971 the term "cerebral sclerosis (general)" is classified to Generalized ischemic cerebrovascular disease (ICDA No. 437) rather than to Other demyelinating diseases of central

nervous system (ICDA No. 341). As a result of this transfer, the number of deaths assigned to this latter category decreased from 569 for 1970 to 96 for 1971.

For 1973 the significant coding changes were concerned with the sudden infant death syndrome (SIDS).

SIDS, frequently called crib death or cot death, has been defined as the sudden and unexpected death of a previously healthy infant (usually between 1 and 6 months of age) which remains unexplained after careful post mortem studies. SIDS almost always occurs during sleep periods. This phenomenon seldom occurs in an infant under 1 month or over 1 year of age. There are no specific symptoms identifiable with SIDS. Therefore, SIDS cannot be predicted, even by a physician, and in the light of present knowledge, SIDS cannot be prevented. An autopsy usually reveals congestion and edema of the lungs and minor inflammatory changes in the respiratory system. In about 85 percent of the cases, intrathoracic petechial hemorrhages are found. However, evidence of a conventionally accepted lethal lesion(s) is lacking. Because of these characteristic features, experts and researchers in the field consider SIDS a clearly identifiable distinctive entity even though the cause and mechanism of death remain unknown.

Estimates of the number of SIDS deaths vary. Efforts to obtain accurate data on the incidence of SIDS have been hampered by a number of factors. Among these are the following:

1. The failure of a number of physicians, coroners, and medical examiners to diagnose and/or report SIDS as the cause of death.
2. The lack of uniformity in the terminology used to describe SIDS.
3. The absence of a category in the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States* (ICDA), which identifies SIDS.
4. The reluctance on the part of certifiers to report conditions that they feel may be regarded as unacceptable by vital statistics offices.
5. The reporting of conditions, including incidental autopsy findings, that were in fact unrelated to death on the certificates of death for infants who actually died from SIDS.

NCHS has modified the ICDA and the procedures for classifying information recorded on the death certificate to facilitate the identification and analysis of data related to known and suspected cases of SIDS.

Three fourth-digit subdivisions have been created under ICDA category 795 (Sudden death). These subdivisions together with the inclusion terms are as follows:

*795.0	Sudden infant death syndrome, under 1 year of age	
	Acute fatal infant syndrome	
	Cause unknown	
	Cot or crib death	
	Died without sign of disease, so stated	
	Found dead (in bed, cot, cradle, crib, etc.) (infant)	
	Infant found in bed	
	Other unknown and unspecified causes, so stated	
	SDII, SID, SIDS, SUDI, SUID	
	Sudden death (in infancy) (infant) (syndrome) (unattended) (unexpected) (unexplained)	
	Undetermined (cause) (in infancy) (infant)	
	Unexpected death (in infancy) (infant)	
	Unexplained death (in infancy) (infant)	
	Unknown (cause)	
*795.1	Sudden death syndrome, 1 year of age	
	The same terms under *795.0 when age is 1 year	
*795.2	All other sudden deaths, age 2 years and over	
	Died suddenly	Fell dead
	Dropped dead	Sudden death

It should be noted that two of the above subdivisions (i.e., *795.0 and *795.1) include several terms that were previously included under ICDA categories 796.2, Found dead (cause unknown), 796.3, Died without sign of disease, and 796.9, Other unknown and unspecified causes. The decision to include these terms in the categories that have been created for Sudden infant death syndrome, under 1 year of age, and Sudden death syndrome, 1 year of age, was made after consultation with experts in the field. This decision was based on conclusions drawn from a recent study that relatively few infant deaths that were not sudden and unexpected are certified as found dead, died without sign of disease, or other unknown and unspecified causes.

The third subdivision (i.e., *795.2) does not include terms previously classifiable to ICDA categories 796.2, 796.3, or 796.9. Coders should continue to classify these terms to categories 796.2, 796.3, and 796.9 if the decedent was 2 years of age or over.

A distinction has been made between Sudden infant death syndrome, under 1 year of age, and Sudden death syndrome, 1 year of age (but under 2 years of age), because there is some difference of opinion about whether SIDS does in fact occur at ages 1 year and over. National data for 1973, the first year NCHS used the new coding rules, show 3,264 deaths coded to category *795.0 and 75 deaths coded to category *795.1.

Apparently, some vital statistics offices have, perhaps unintentionally, created the impression that SIDS is not an acceptable cause of death. This is unfortunate since it is important that SIDS be cited officially as the cause of death when the certifier believes this to be the case. This diagnosis as well as

other terms that are being used to describe SIDS should be accepted as a valid cause of death without querying the certifier. Past experience has shown that some certifiers are reluctant to use terminology that they have reason to believe will be queried by vital statistics offices.

Coding in 1978.—The National Center for Health Statistics usually prepares for its cause-of-death coding clerks an instruction manual which contains decisions and interpretations that apply each year. These manuals are revised annually, chiefly to bring coding procedures into alignment with new developments in reporting practices and in medical opinions as to the etiology and causal relationship of diseases and to eliminate inconsistencies in coding procedures.[22] No significant coding changes occurred for 1978.

Medical certification.—The use of a standard classification list, although essential for State, regional, and international comparison, does not assure strict comparability of the tabulated figures. A high degree of comparability between areas could be attained only if all records of cause of death were reported with equal accuracy and completeness. The medical certification 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 medical attendant to make the proper diagnosis and by the care with which he completes the death certificate.

The quality of the basic data reported on the death certificate is of fundamental importance in the interpretation of cause-of-death statistics. A pilot study was based on a sample of deaths occurring in Pennsylvania during 3 months in 1956. A representative sample of certificates was selected for particular causes of death. Questionnaires were sent to the physicians who had signed the certificates asking for the diagnostic methods and pertinent findings on which the medical certification of death was based. The returns were reviewed along with the original cause-of-death statement and rated for quality (type and amount) of supporting diagnostic information. For 39 percent of the cases the diagnostic data given were sketchy, and for 58 percent the information was considered good or very good. The quality of the diagnostic information varied considerably with the cause of death. It was concluded that in Pennsylvania the diagnostic data for many disease categories provided an adequate base for medical certification of the cause of death.[23]

In a later followback study conducted by NCHS, a national sample of deaths occurring in July and August 1960 was selected from the 10-percent Current Mortality Sample. A questionnaire was sent to the physician, coroner, or medical examiner signing the death certificate and to the hospitals and others suggested by the medical examiner as possible added sources of diagnostic information. Eighty-seven percent of the medical certifiers returned a questionnaire with some kind of response. Of those returned, 14 percent contained no useful information. The forms were reviewed by two cardiologists to determine whether or not the cause of death assigned was supported by the diagnostic information provided by the certifier. The results showed that "for cardiovascular-renal diseases as a whole, it is estimated that 70 to 75 percent of the deaths so classified may be considered as a reasonable inference or better."[24]

One index of the quality of reporting causes of death is the proportion of death certificates coded to the Eighth Revision category numbers 780-792, 795, and 796, which are the rubrics for Symptoms and other ill-defined conditions. While there are cases for which it is not possible to determine the causes of death, this proportion indicates the care and consideration given to the certification by attending physicians. It may also be used as a rough measure of the specificity of the medical diagnoses made by the physicians in various areas and, to a small degree, the extent to which autopsies are performed and their findings used in determining the underlying cause of death entered on the death certificate. In 1978, 1.6 percent of all reported deaths in the United States were assigned to ill-defined or unknown causes. However, this percentage varied among the States, from 0.4 percent for Rhode Island to 7.6 percent for Mississippi.

Ranking causes of death.—The causes included in the List of 69 Selected Causes of Death have been ranked on the basis of the number of deaths assigned to each cause. Two group titles—Major cardiovascular diseases and Symptoms and ill-defined conditions—are not ranked. In addition, category titles that begin with the words "Other" or "All other" are not ranked. The remaining titles are ranked to determine the leading causes of death. When one of the titles

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[22]National Center for Health Statistics: Vital statistics, instructions for classifying the underlying cause of death, 1976-78. *NCHS Instruction Manual,* Part 2a. Health Resources Administration. Rockville, Md., Dec. 1976.

[23]For a more complete report see "Inquiry Into Diagnostic Evidence Supporting Medical Certifications of Death," by I. M. Moriyama and others, *Am. J. Pub. Health,* Vol. 48, No. 10, pp. 1376-1387.

[24]Moriyama, I. M., and others: Evaluations of Diagnostic Information Supporting Medical Certification of Cardiovascular Disease Deaths. Paper presented at a meeting of the American Public Health Association, Kansas City, Mo., Nov. 13, 1963.

that represents a subtotal is ranked, as in the case of Tuberculosis, all forms, its component parts (in this case, Tuberculosis of respiratory system and Tuberculosis, other forms) 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. The maternal conditions are those assigned to Complications of pregnancy, childbirth, and the puerperium (630-678).

Report of autopsy

Prior to 1972 the year 1958 was the last year for which autopsy data were tabulated. For 1972-78 all registration areas requested information on the death certificate as to whether autopsies were performed. For 1978 autopsies were reported on 303,134 death certificates (15.7 percent of the total, table 1-28).

Information as to whether the autopsy findings were used in determining the causes of death were tabulated for 1972-77 for all but eight or nine registration areas. The autopsy findings used item was deleted from the 1978 Standard Certificate of Death.

For six of the cause-of-death categories shown in table 1-29, autopsies were reported as performed for 50 percent or more of all deaths (Whooping cough; Meningococcal infections; Abortions; Other complications of pregnancy, childbirth, and the puerperium; Homicide; and Other external causes).

There were eight other categories for which 40 percent or more death certificates reported autopsies. Autopsies were reported for 9.7 percent of the major cardiovascular diseases. Among all causes other than the major cardiovascular group, autopsies were reported for 21.8 percent of all deaths.

Mortality by month and date of death

Deaths by month have been regularly tabulated and published in the annual report for each year beginning with data year 1900. For 1978, deaths by month are shown in this report in tables 1-20, 1-21, 1-24, 1-30, 2-10, 2-12, and 3-9.

The year 1972 was the first data year for which date of death was published (table 1-30). Unpublished data for selected causes by date of death for 1962 are available in NCHS.

Number of deaths by date of death in this report are shown for 1978 for the total number of deaths and for the number of deaths for the following three causes, for which the greatest general interest in date of occurrence of death has been expressed: Motor vehicle accidents, Suicide, and Homicide.

These data in table 1-30 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.

QUALITY OF DATA

Completeness of registration

Although every State has adopted a law requiring the registration of births, deaths, and fetal deaths, these laws are not uniformly observed. In most areas practically all births and deaths are registered. For some areas, however, there is enough underregistration to affect the use of the statistics for certain purposes.

Quantitative information on completeness of death registration is not available. One condition for admission to the national registration areas was a demonstrated registration completeness of at least 90 percent, although the method used in testing completeness was subject to considerable error. It is believed that in the past, death registration for the United States has been more complete than birth registration, but the difference now may be rather small. There is evidence, however, that in certain isolated areas, incomplete registration is still a problem. For example, a study made in a few selected counties of Tennessee, where the death rates for 1949-51 were unusually low, served to locate a number of unregistered deaths.[25] A similar situation may exist in other States.

As previously stated, reporting requirements for fetal deaths vary from State to State, and registration is probably incomplete in all areas.

Massachusetts data

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

Quality control procedures

Demographic items on the death certificate.—As previously indicated, for 1978 the mortality data for these items were obtained from two sources: (1) Microfilm images of the original certificates furnished by 14 States, the District of Columbia, and the Virgin Islands, and photocopies from Guam; and (2) records

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[25] Tennessee Department of Public Health: Results of survey of death-registration completeness. *The Spotlight,* Jan. 1954.

on data tape furnished by the remaining 36 States, New York City, and Puerto Rico. For the 14 States, the District of Columbia, the Virgin Islands, and Guam that send only copies of the original certificates, the demographic items on a 10-percent sample of the certificates were independently verified. For the 33 States, New York City, and Puerto Rico that furnished records on data tape before 1978, the demographic items on about 200 records per State per month were independently verified. For the three States (Indiana, Utah, and Washington) that furnished records on data tape for the first time for 1978, the demographic items were independently verified for a 50-percent sample for the first 3 months, and for about 200 records per area for each of the last 9 months of 1978.

Except for cause-of-death coding discussed below, the above-mentioned verification procedures involve controlling two types of error (coding and entering into the data record tape) at the same time, and the error rates are a combined measure of both types. While it may be assumed that the entering errors are randomly distributed across all items on the record, this assumption cannot be made as readily for coding errors. Systematic errors in coding infrequent events may escape detection during sample verification. This type of error is partially controlled by reverifying randomly selected lots from each operator's work.

Medical items on the death certificate.—The "Automated Classification of Medical Entities" (ACME), a computer system for assigning the underlying cause of death which was introduced in 1968, was used for assigning the 1978 underlying causes of death.[26] The ACME rules for coding conditions are very specific, fewer in number, and far less complicated than the international rules for selecting the underlying cause of death.[27]

The coder produces condition codes which the ACME computer program matches against decision tables to select the underlying cause of death for each record according to the international rules. These decision tables serve two primary purposes. They provide a comprehensive guide for the relationship between conditions classifiable to different categories in the ICDA when applying rules of selection and modification, and they also provide decisions used when the underlying cause is assigned by the ACME system. The tables were developed from the decisions and conclusions employed by NCHS in arriving at the underlying causes of death. Relationships between medical conditions involve varying or contradictory opinions. Therefore further refinements of the decision tables will be required periodically.

The decision table instruction manual for 1970-71,[28] with some modifications, was also used for 1972-78.

For the States that did not furnish State-coded medical data, the medical items were coded for 100 percent of death records. Then the medical items on a 10-percent sample of the records were independently verified. For the seven States (Iowa, Louisiana, Michigan, Nebraska, North Carolina, Virginia, and Wisconsin) that furnished State-coded medical data, the medical items were independently verified for about 200 records per State per month.

For cause-of-death coding, systematic errors in coding infrequent events are controlled by listing the rare and impossible codes from the computer and reverifying the cause-of-death assignment. Similar procedures are utilized to assure consistency between cause-of-death and age and/or sex items.

Demographic items on reports of fetal death.—As previously stated, reports of fetal death for 1978 are based on fetal-death records received. Moreover the coding and entering on data tape of fetal-death records were verified completely because of their relatively small number. (Again for 1978, as for prior years, medical items on the reports of fetal death were not coded.)

Other control procedures.—After completing coding and entering on data tape, record counts are balanced against control totals for each shipment of records from a registration area. Impossible codes are selected out during the editing processes on the computer and are either corrected by reference to the source record or adjusted by arbitrary code assignment. All subsequent operations in tabulating and in table preparation are verified either during the computer processing or by statistical clerks.

Estimates of errors arising from 50-percent sample for 1972

Death statistics for 1972 in this report (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 of *Vital Statistics of the United States*, Volume II, Part A, 1972.

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[26]Automated Classification of Medical Entities (ACME) for Selection of Causes of Death. Unpublished paper presented at the annual meeting of the American Public Health Association, Houston, Tex., Oct. 1970.

[27]See footnote 22.

[28]National Center for Health Statistics: Vital statistics, ICDA Eighth Revision decision tables for classifying underlying causes of death, 1970-1971. *NCHS Instruction Manual*, Part 2a. Public Health Service. Rockville, Md., 1972.

COMPUTATION OF RATES AND OTHER MEASURES

Population bases

The death rates shown in this report were computed on the basis of population statistics published or made available by the U.S. Bureau of the Census. Rates for 1940, 1950, 1960, and 1970 are based on the populations enumerated as of April 1 in the censuses of those years. Rates for all other years are based on the estimated midyear (July 1) population for the respective years. Population estimates for 1971-78 are based on the results of the 1970 Census of Population, estimates of census coverage, and data for components of change. Inaccuracies occur in these data sources particularly for the older population. Those inaccuracies are reflected in age-specific death rates and life table values, particularly in the age groups 65-69 years and over for All other males and females.

Population estimates for 1978.—Estimates of the total resident population of the United States by age, race, and sex in 1978 are published by the Bureau of the Census in *Current Population Reports,* Series P-25, Number 870, and are shown in table 6-2. Total estimated populations for States shown in table 6-3 are published in Series P-25, Number 876; populations by broad age groups were prepared by the Bureau of the Census for NCHS and do not appear in the P-25 Series.

The populations of the 50 largest SMSA's and their component counties for July 1, 1978 are published by the Bureau of the Census in *Current Population Reports,* Series P-25, Number 873.

Population estimates for 1971.—The rates by age, color, and sex in Section 1 of *Vital Statistics of the United States, 1971,* were based on provisional estimates of the 1971 population; but the life table values for 1971 in section 5 were based on revised estimates of the 1971 population. These revised estimates are shown in *Current Population Reports,* Series P-25, No. 519, Washington, D.C., 1974. These revised estimates differed considerably from the provisional estimates for a number of age-color-sex groups. Table 6-4 of the report for 1971 shows, for example, that the revised estimates are 7 to 25 percent lower than the provisional estimates for persons other than white in the youngest (under 10 years) and oldest (80 years and over) age groups. The limited number of statistics for 1971 shown in this report are based on the revised populations. Also available in NCHS is a set of unpublished trend tables for which the rates for 1971 are based on the revised population. These tables include age-color-sex-cause specific death rates for both the List of 69 Selected Causes of Death and the List of 281 Selected Causes of Death.

Population estimates for 1961-69.—Comparison of revised populations for 1969 (and several earlier years since 1960) with the provisional populations which were used to calculate annual death rates for these same age, color, and sex groups indicated a similar problem. The rates shown in tables 1-1, 1-2, 1-3, and 1-7, the life table values in table 5-5, and the population estimates in table 6-1 for each year in the period 1961-69 have been revised to reflect modified population bases, as published in the U.S. Bureau of Census, *Current Population Reports,* Series P-25, No. 519. The data shown in tables 1-10 and 1-11 for 1961-69 have not been revised.

Rates and ratios based on live births.—Infant, neonatal, and maternal mortality rates, and fetal death rates and ratios are computed on the basis of the number of live births instead of the estimated population under 1 year of age.

New Jersey.—As previously indicated, data by race or color are not available for New Jersey for 1962 and 1963. Therefore for 1962 and 1963 the National Center for Health Statistics estimated a population by age, color, and sex excluding New Jersey for rates shown by color. The methodology used to estimate the revised population excluding New Jersey is discussed in the Technical Appendixes of the 1962 and 1963 reports.

Age-adjusted death rates

Age-adjusted death rates shown in this report are computed by using the distribution in 10-year age intervals of the enumerated population of the United States in 1940 as the standard population. Each figure represents the rate that would have existed if the age-specific rates of the particular year prevailed in a population whose age distribution was like that of the United States in 1940. The rates for the total population and for each color-sex group were adjusted separately, using the same standard population. It is important not to compare age-adjusted death rates directly with crude rates shown in other tables. The standard population, on the basis of one million total population, is as follows:

Age	Number
All ages	1,000,000
Under 1 year	15,343
1-4 years	64,718
5-14 years	170,355
15-24 years	181,677
25-34 years	162,066
35-44 years	139,237
45-54 years	117,811
55-64 years	80,294
65-74 years	48,426
75-84 years	17,303
85 years and over	2,770

Life tables

United States abridged life tables are constructed by reference to a standard table.[29] Life tables for the decennial period 1969-71 are used as the standard life tables in constructing the 1970-78 abridged life tables; life table values for 1970-73 appearing in this publication have been revised. Abridged life tables appearing in *Vital Statistics of the United States* for 1970-73 were constructed using the 1959-61 decennial life tables as the standard tables, since the 1969-71 decennial life tables were not yet available. In addition, life table values for 1951-59 and 1961-69 appearing in this publication are based on revised intercensal estimates of the populations for those years. As such, these life table values may differ from the life table values for those years published in previous volumes.

There has been an increasing interest in data on average length of life ($\mathring{e}_0$) for single calendar years prior to the initiation of the annual abridged life table series in 1945. The figures in table 5-5 for the color and sex groups for the following years were estimated to meet these needs.[30]

Years	*Color and sex groups*
1900-1945	Total
1900-1947	Male
1900-1947	Female
1900-1950	White
1900-1944	White, male
1900-1944	White, female
1900-1950	All other
1900-1944	All other, male
1900-1944	All other, female

The geographic areas covered in life tables before 1929-31 were limited to the death-registration areas. Life tables for 1919-21 were constructed using mortality data from the 1920 death-registration States—34 States and the District of Columbia. For 1900-1902 and 1909-1911, life tables were constructed using mortality data from the 1900 death-registration States—10 States and the District of Columbia. The tables for the period 1929-31 through 1978 cover the conterminous United States. United States life tables include data for Alaska beginning in 1959 and for Hawaii beginning in 1960. Decennial life table values for the period 1959-61 were derived from data which include both Alaska and Hawaii for each year.

Random variation of death rates

The numbers of deaths reported for a community represent complete counts of such events. As such, they are not subject to sampling error, although they are subject to errors in the registration process. However, when the figures are used for analytical purposes, such as the comparison of rates over a time period 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.[31] 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. Estimates of standard error and tests of significance under this assumption are described in most standard statistics texts. When the number of events is large, the standard error, expressed as a percent of the number or rate, 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 conditions described by the figures. This is particularly true for infant mortality rates, cause-specific death rates, and death rates for counties. Events of rare nature may be assumed to follow a Poisson probability distribution. For this distribution, a simple approximation may be used to estimate the error, as follows:

If N is the number of deaths and R is the corresponding rate, the chances are 19 in 20 that

1. The "true" number of events lies between

$$N - 2\sqrt{N} \text{ and } N + 2\sqrt{N}$$

2. The "true" rate lies between

$$R - 2\frac{R}{\sqrt{N}} \text{ and } R + 2\frac{R}{\sqrt{N}}$$

If the rate R corresponding to N events is compared with the rate S corresponding to M events, the difference between the two rates may be regarded as statistically significant, if it exceeds

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[29]National Center for Health Statistics: Comparison of two methods of constructing abridged life tables by reference to a "standard" table, by M. G. Sirken. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 2-No. 4. Public Health Service. Washington. U.S. Government Printing Office, 1966.

[30]For estimating procedure see National Office of Vital Statistics, "Estimated Average Length of Life in the Death-Registration States," by T. N. E. Greville and G. A. Carlson, *Vital Statistics–Special Reports,* Vol. 33, No. 9, Public Health Service. Washington, D.C., 1951.

[31]National Office of Vital Statistics: Standard error of the age-adjusted death rate, by C. L. Chiang. *Vital Statistics–Special Reports,* Vol. 47, No. 9. Public Health Service. Washington, D.C., Aug. 1961.

$$2\sqrt{\frac{R^2}{N}+\frac{S^2}{M}}$$

For example, if the observed death rate for Community A was 10.0 per 1,000 population and if this rate were based on 20 recorded deaths, then the chances are 19 in 20 that the "true" death rate for that community lies between 5.5 and 14.5 per 1,000 population. If the death rate for Community A of 10.0 per 1,000 population were being compared with a rate of 20.0 per 1,000 population for Community B which is based on 10 recorded deaths, then the difference between the rates for the two communities is 10.0. This difference is less than twice the standard error of the difference

$$2\sqrt{\frac{(10.0)^2}{20}+\frac{(20.0)^2}{10}}$$

of the two rates which is computed to be 13.4. From this, it is concluded that the difference between the rates for the two communities is not statistically significant.

Net census undercount

Mortality statistics may be subject to underregistration of deaths and misclassification of the demographic characteristics reported on the death certificate. Another source of error in the death statistics concerns the population figures used in computing death rates. Intercensal population estimates are affected by undercounts or overcounts in the decennial census. The net census undercount is determined by both undercount and by misclassification of demographic characteristics. The effect of the net census undercounts (or overcounts) on the death rates also depends on the misreporting of age on the death certificate.[32] While mortality statistics are not adjusted for possible age misreporting, mortality rates based on populations adjusted for net census undercount may be more accurate than rates based on the unadjusted populations. Thus it is useful to consider the possible impact of net census undercount on death statistics.

The U.S. Bureau of the Census has conducted extensive research to evaluate the completeness of coverage of the U.S. population (including undercount and misstatement of age, race, and sex) in the last three decennial censuses—1950, 1960, and 1970. These studies provide estimates of the national population that was not enumerated in the respective censuses, by age, color, and sex, as well as a set of exploratory estimates of coverage for States.[33,34] The reports for 1970 include ranges of estimates of net census undercount based on alternative methodological assumptions for age, race, and sex subgroups of the national population and illustrative estimates for individual States.

These evaluative studies indicate that there is differential coverage in the census among the population subgroups; that is, some age, color, and sex groups are more completely enumerated than others. To the extent that these estimates are valid, that the net undercounts are substantial, and that they vary among subgroups and geographic areas, net census undercounts can have consequences for vital statistics measures.[35]

The impact of net census undercounts on vital statistics measures can be of several types: (1) Effects on levels of the observed rates, (2) effects on differences among groups; and (3) effects on the levels and group differences shown by summary measures such as age-adjusted rates and life expectancy.

Levels and differentials.—The levels of vital statistics rates are modified by adjustments for persons who were not counted in the census of population. If adjustments are made for persons who were not counted in the census of population, the size of the denominators is generally increased and the rate is smaller than without an adjustment. The adjusted rates for 1970 can be computed by multiplying the reported rates by ratios of the census-level population to the population adjusted for the estimated net census undercount (table 6-4). A ratio of less than 1.0 indicates a net census undercount and a corresponding decrease in the death rate. A ratio greater than 1.0 indicates a net census overcount and would result in an increase in the death rate.

In general, females were more completely enumerated than males, and the white population was more completely enumerated than the all other

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[32]National Center for Health Statistics: Comparability of age on the death certificate and matching census records, United States, May-August 1960, by T. Z. Hambright. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 2-No. 29. Public Health Service. Washington. U.S. Government Printing Office, June 1968.

[33]U.S. Bureau of the Census: Developmental estimates of the coverage of the population of States in the 1970 Census—demographic analysis. *Current Population Reports.* Series P-23, No. 65. Washington. U.S. Government Printing Office, Dec. 1977.

[34]U.S. Bureau of the Census: *1970 Census of Population and Housing.* Estimates of coverage of the population by sex, race, and age—demographic analysis. Evaluation and Research Program. PHC(E)-4. Washington. U.S. Government Printing Office, 1974.

[35]Ibid.

population in the 1970 Census of Population. The age groups 25-34 and 35-44 years were most underenumerated for males, while the age group 75-84 years was most underenumerated for females. There was an estimated 5-percent underenumeration of white males and a 13-percent underenumeration of all other males in the age group 25-34 years as well as a 16-percent underenumeration of all other males in the age group 35-44 years. An estimated 6 percent of white females and 15 percent of all other females were not enumerated in the age group 75-84 years. Also for the age group under 1 year, there was an 11-percent underenumeration for the all other population compared with only 1 percent underenumeration in the same age group for the white population.

Hence if vital statistics measures are calculated with adjustments for net census undercounts for each of these subgroups, the resulting rates will be differentially reduced from their original levels; that is, rates for those groups with the greatest estimated undercounts will show the greatest relative reductions due to these adjustments. Thus the ratio of mortality between the rates for males and females, and between the rates for the white and the all other population will usually 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, for the age group 25-34 years in 1970, the ratio of the rates for Homicide for all other males to that for white males is 10.6, while the ratio of the death rates corrected for net census undercount is 9.6. Therefore the adjustment for net census undercount would reduce the ratio by 9.4 percent. For Malignant neoplasms of respiratory system, also for the age group 25-34 in 1970, the ratio of the death rate for males to the death rate for females would decrease from 2.5 to 2.3 if the populations were corrected for net census undercount. This reflects the greater underenumeration among males in this age group.

Summary measures.—The effect of net census undercount on age-adjusted death rates depends on the underenumeration of each age group and on the distribution of deaths by age. Thus the age-adjusted death rate in 1970 for all causes for the United States would decrease from 7.1 deaths per 1,000 population to 7.0 deaths per 1,000 population if the age-specific death rates were corrected for net census undercount.

For deaths from Homicide the age-adjusted death rate for white males would decrease by 2.7 percent, from 7.3 to 7.1 deaths per 100,000 population, while the age-adjusted death rate for black males would decrease by 10.4 percent, from 72.8 to 65.2 deaths per 100,000 population.

If death rates by age are reduced, then the corresponding life expectancy at birth based on these rates would increase. Thus the general effect of correcting the death rates for the net census undercount is to increase the estimate of life expectancy at birth. In addition the differential underenumeration among race-sex groups would lead to a greater increase in the life expectancy for some groups than for others. For the white population, which experienced less underenumeration in the 1970 Census of Population (table 6-4), the effect of adjustment for net census undercount would, accordingly, be less than that for the black population.

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	*

Table 6–1. Population of Birth- and Death-Registration States, 1900–1932, and United States, 1900–1978

[Population enumerated as of April 1 for 1940, 1950, 1960, and 1970 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
1978	218,717,000	218,228,000	1936	129,969,000	129,824,939	...	...	...	...
1977	216,811,000	216,332,000	1937	128,961,000	128,824,829	...	...	...	...
1976	215,116,000	214,649,000	1936	128,181,000	128,053,180	...	...	...	...
1975	213,540,000	213,032,000	1935	127,362,000	127,250,232	...	...	...	...
1974	211,909,000	211,390,000	1934	126,485,000	126,373,773	...	...	...	...
1973	210,404,000	209,851,000	1933	125,690,000	125,578,763	...	...	...	...
1972	208,842,000	208,230,000	1932	124,949,000	124,840,471	47	118,903,899	47	118,903,899
1971	207,045,000	206,212,000	1931	124,149,000	124,039,648	46	117,455,229	47	118,148,987
1970	204,270,000	203,211,926	1930	123,188,000	123,076,741	46	116,544,946	47	117,238,278
1969	202,677,000	201,385,000	1929	---	121,769,939	46	115,317,450	46	115,317,450
1968	200,706,000	199,399,000	1928	---	120,501,115	44	113,636,160	44	113,636,160
1967	198,712,000	197,457,000	1927	---	119,038,062	40	104,320,830	42	107,084,532
1966	196,560,000	195,576,000	1926	---	117,399,225	35	90,400,590	41	103,822,683
1965	194,303,000	193,526,000	1925	---	115,831,963	33	88,294,564	40	102,031,555
1964	191,889,000	191,141,000	1924	---	114,113,463	33	87,000,295	39	99,318,096
1963	189,242,000	188,483,000	1923	---	111,949,945	30	81,072,123	38	96,788,197
1962	186,538,000	185,771,000	1922	---	110,054,778	30	79,560,746	37	92,702,901
1961	183,691,000	182,992,000	1921	---	108,541,489	27	70,807,090	34	87,814,447
1960	179,933,000	179,323,175	1920	---	106,466,420	23	63,597,307	34	86,079,263
1959	177,264,000	176,513,000	1919	105,063,000	104,512,110	22	61,212,076	33	83,157,982
1958	174,141,000	173,320,000	1918	104,550,000	103,202,801	20	55,153,782	30	79,008,412
1957	171,274,000	170,371,000	1917	103,414,000	103,265,913	20	55,197,952	27	70,234,775
1956	168,221,000	167,306,000	1916	---	101,965,984	11	32,844,013	26	66,971,177
1955	165,275,000	164,308,000	1915	---	100,549,013	10	31,096,897	24	61,894,847
1954	162,391,000	161,164,000	1914	---	99,117,567	...	...	24	60,963,309
1953	159,565,000	158,242,000	1913	---	97,226,814	...	...	23	58,156,740
1952	156,954,000	155,687,000	1912	---	95,331,300	...	...	22	54,847,700
1951	154,287,000	153,310,000	1911	---	93,867,814	...	...	22	53,929,644
1950	151,132,000	150,697,361	1910	---	92,406,536	...	...	20	47,470,437
1949	149,188,000	148,665,000	1909	---	90,491,525	...	...	18	44,223,513
1948	146,631,000	146,093,000							
1947	144,126,000	143,446,000	1908	---	88,708,976	...	...	17	38,634,759
1946	141,389,000	140,054,000	1907	---	87,000,271	...	...	15	34,552,837
1945	139,928,000	132,481,000	1906	---	85,436,556	...	...	15	33,782,288
1944	138,397,000	132,885,000	1905	---	83,819,666	...	...	10	21,767,980
			1904	---	82,164,974	...	...	10	21,332,076
1943	136,739,000	134,245,000							
1942	134,860,000	133,920,000	1903	---	80,632,152	...	...	10	20,943,222
1941	133,402,000	133,121,000	1902	---	79,160,196	...	...	10	20,582,907
1940	131,820,000	131,669,275	1901	---	77,585,128	...	...	10	20,237,453
1939	131,028,000	130,879,718	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: The populations in this table were published by the U.S. Bureau of the Census, unless otherwise specified, in *Current Population Reports*, Series P-25. The numbers of these reports together with the years for which data were furnished are shown below:

Year for which data were furnished	Series P-25 number	Year for which data were furnished	Series P-25 number	Year for which data were furnished	Series P-25 number
1978	870	1970	(a)	1930–39	499 and (c)
1977	721	1961–69	519	1920–29	(c)
1975–76	643	1960	(b)	1917–19	499 and (c)
1974	529	1951–59	310	1900–16	(c)
1971–73	519	1940–50	499		

[a]U.S. Bureau of the Census, *U.S. Census of Population: 1970, Number of Inhabitants*, Final Report PC(1)-A1, United States Summary, 1971
[b]U.S. Bureau of the Census, *U.S. Census of Population, 1960, Number of Inhabitants*, PC(1)-A1, United States Summary, 1964
[c]National Office of Vital Statistics, *Vital Statistics Rates in the United States, 1900–1940*, 1947.

Table 6–2. Estimates of Total Resident Population of the United States, by Age, Race, and Sex: July 1, 1978

[Figures include Armed Forces stationed in the United States and exclude those stationed outside the United States. Due to rounding to the nearest thousand, detailed figures may not add to totals]

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	218,228,000	106,120,000	112,108,000	188,657,000	92,035,000	96,622,000	29,571,000	14,085,000	15,486,000	25,487,000	12,119,000	13,369,000
Under 1 year	3,203,000	1,639,000	1,564,000	2,644,000	1,355,000	1,289,000	559,000	283,000	275,000	474,000	240,000	234,000
1–4 years	12,174,000	6,225,000	5,950,000	9,991,000	5,121,000	4,870,000	2,183,000	1,104,000	1,079,000	1,862,000	943,000	920,000
5–9 years	16,895,000	8,623,000	8,272,000	13,959,000	7,144,000	6,815,000	2,937,000	1,479,000	1,458,000	2,540,000	1,279,000	1,261,000
10–14 years	18,589,000	9,479,000	9,111,000	15,483,000	7,915,000	7,568,000	3,107,000	1,564,000	1,543,000	2,745,000	1,380,000	1,364,000
15–19 years	21,013,000	10,647,000	10,366,000	17,716,000	8,997,000	8,718,000	3,297,000	1,649,000	1,648,000	2,906,000	1,451,000	1,456,000
20–24 years	20,263,000	10,118,000	10,144,000	17,302,000	8,700,000	8,602,000	2,961,000	1,418,000	1,543,000	2,549,000	1,215,000	1,334,000
25–29 years	17,959,000	8,897,000	9,062,000	15,506,000	7,767,000	7,741,000	2,451,000	1,130,000	1,321,000	2,049,000	949,000	1,100,000
30–34 years	15,852,000	7,829,000	8,024,000	13,834,000	6,907,000	6,928,000	2,018,000	922,000	1,096,000	1,651,000	754,000	897,000
35–39 years	13,034,000	6,353,000	6,682,000	11,397,000	5,616,000	5,781,000	1,638,000	737,000	901,000	1,393,000	628,000	765,000
40–44 years	11,311,000	5,505,000	5,806,000	9,871,000	4,856,000	5,015,000	1,440,000	649,000	790,000	1,228,000	556,000	672,000
45–49 years	11,364,000	5,540,000	5,824,000	9,969,000	4,892,000	5,077,000	1,395,000	648,000	747,000	1,182,000	552,000	630,000
50–54 years	11,827,000	5,699,000	6,129,000	10,525,000	5,095,000	5,430,000	1,302,000	603,000	699,000	1,121,000	521,000	599,000
55–59 years	11,241,000	5,365,000	5,876,000	10,099,000	4,834,000	5,265,000	1,142,000	531,000	611,000	1,005,000	466,000	539,000
60–64 years	9,436,000	4,419,000	5,017,000	8,548,000	4,015,000	4,533,000	887,000	404,000	483,000	792,000	357,000	435,000
65–69 years	8,576,000	3,803,000	4,773,000	7,650,000	3,398,000	4,252,000	926,000	405,000	521,000	850,000	364,000	486,000
70–74 years	6,364,000	2,687,000	3,677,000	5,817,000	2,442,000	3,375,000	547,000	245,000	302,000	481,000	210,000	271,000
75–79 years	4,171,000	1,631,000	2,540,000	3,842,000	1,487,000	2,356,000	329,000	145,000	184,000	266,000	114,000	153,000
80–84 years	2,748,000	973,000	1,774,000	2,517,000	882,000	1,634,000	231,000	91,000	140,000	196,000	74,000	122,000
85 years and over	2,206,000	688,000	1,518,000	1,983,000	610,000	1,373,000	223,000	78,000	145,000	195,000	65,000	130,000

Source: U.S. Bureau of the Census: *Current Population Reports*, Series P-25, No. 870.

Table 6–3. Estimates of Total Resident Population, by Age, for the United States, Each Division and State, Guam, Puerto Rico, and Virgin Islands: July 1, 1978

[Figures include Armed Forces stationed in each area, and exclude Armed Forces stationed outside the United States. Due to rounding to the nearest thousand, detailed figures may not add to totals]

Division and State	Total	Under 5 years	5–19 years	20–44 years	45–64 years	65 years and over
United States	218,228,000	15,378,000	56,497,000	78,419,000	43,868,000	24,065,000
Geographic Divisions:						
New England	12,267,000	720,000	3,149,000	4,382,000	2,563,000	1,453,000
Middle Atlantic	36,825,000	2,258,000	9,205,000	12,790,000	8,190,000	4,380,000
East North Central	41,221,000	2,898,000	10,982,000	14,851,000	8,188,000	4,302,000
West North Central	17,036,000	1,186,000	4,420,000	5,972,000	3,326,000	2,132,000
South Atlantic	34,650,000	2,399,000	8,851,000	12,529,000	6,873,000	3,993,000
East South Central	13,960,000	1,071,000	3,723,000	4,922,000	2,699,000	1,544,000
West South Central	22,035,000	1,792,000	5,896,000	7,931,000	4,133,000	2,283,000
Mountain	10,364,000	922,000	2,800,000	3,757,000	1,918,000	969,000
Pacific	29,872,000	2,134,000	7,471,000	11,282,000	5,973,000	3,011,000
New England:						
Maine	1,092,000	76,000	291,000	369,000	224,000	133,000
New Hampshire	869,000	58,000	229,000	316,000	169,000	96,000
Vermont	487,000	34,000	133,000	177,000	88,000	55,000
Massachusetts	5,771,000	325,000	1,473,000	2,073,000	1,200,000	700,000
Rhode Island	932,000	53,000	236,000	320,000	202,000	121,000
Connecticut	3,116,000	174,000	787,000	1,127,000	680,000	348,000
Middle Atlantic:						
New York	17,746,000	1,093,000	4,438,000	6,249,000	3,870,000	2,095,000
New Jersey	7,316,000	450,000	1,855,000	2,540,000	1,646,000	824,000
Pennsylvania	11,763,000	715,000	2,912,000	4,001,000	2,674,000	1,461,000
East North Central:						
Ohio	10,732,000	743,000	2,832,000	3,861,000	2,173,000	1,124,000
Indiana	5,387,000	392,000	1,445,000	1,939,000	1,050,000	561,000
Illinois	11,238,000	800,000	2,935,000	4,018,000	2,281,000	1,204,000
Michigan	9,181,000	648,000	2,516,000	3,377,000	1,771,000	868,000
Wisconsin	4,683,000	315,000	1,254,000	1,656,000	913,000	545,000
West North Central:						
Minnesota	4,024,000	276,000	1,081,000	1,463,000	742,000	462,000
Iowa	2,906,000	198,000	757,000	988,000	585,000	377,000
Missouri	4,847,000	330,000	1,229,000	1,702,000	959,000	627,000
North Dakota	653,000	50,000	176,000	220,000	129,000	78,000
South Dakota	690,000	54,000	185,000	223,000	139,000	89,000
Nebraska	1,569,000	114,000	407,000	544,000	303,000	202,000
Kansas	2,347,000	164,000	585,000	832,000	469,000	297,000
South Atlantic:						
Delaware	584,000	40,000	155,000	219,000	115,000	55,000
Maryland	4,148,000	253,000	1,098,000	1,591,000	836,000	370,000
District of Columbia	671,000	41,000	164,000	266,000	128,000	72,000
Virginia	5,177,000	343,000	1,347,000	1,996,000	1,021,000	468,000
West Virginia	1,861,000	138,000	467,000	627,000	406,000	222,000
North Carolina	5,571,000	400,000	1,460,000	2,072,000	1,088,000	551,000
South Carolina	2,902,000	232,000	802,000	1,076,000	533,000	258,000
Georgia	5,075,000	396,000	1,381,000	1,905,000	920,000	473,000
Florida	8,661,000	556,000	1,977,000	2,777,000	1,826,000	1,524,000
East South Central:						
Kentucky	3,490,000	266,000	919,000	1,241,000	677,000	387,000
Tennessee	4,333,000	311,000	1,113,000	1,561,000	869,000	478,000
Alabama	3,728,000	282,000	998,000	1,312,000	727,000	409,000
Mississippi	2,409,000	212,000	693,000	808,000	426,000	270,000
West South Central						
Arkansas	2,167,000	167,000	557,000	728,000	423,000	292,000
Louisiana	3,978,000	334,000	1,136,000	1,415,000	723,000	370,000
Oklahoma	2,843,000	214,000	709,000	1,000,000	563,000	356,000
Texas	13,047,000	1,077,000	3,494,000	4,788,000	2,424,000	1,265,000
Mountain:						
Montana	780,000	61,000	209,000	271,000	158,000	81,000
Idaho	882,000	84,000	239,000	304,000	167,000	87,000
Wyoming	425,000	38,000	112,000	153,000	87,000	36,000
Colorado	2,706,000	209,000	705,000	1,069,000	492,000	232,000
New Mexico	1,215,000	108,000	351,000	430,000	222,000	104,000
Arizona	2,373,000	208,000	627,000	822,000	445,000	271,000
Utah	1,317,000	163,000	382,000	463,000	207,000	102,000
Nevada	666,000	51,000	175,000	245,000	140,000	56,000
Pacific:						
Washington	3,793,000	265,000	968,000	1,433,000	725,000	401,000
Oregon	2,452,000	179,000	603,000	891,000	494,000	285,000
California	22,314,000	1,573,000	5,534,000	8,434,000	4,524,000	2,248,000
Alaska	411,000	42,000	125,000	176,000	58,000	10,000
Hawaii	902,000	75,000	241,000	348,000	172,000	67,000
Guam	113,800	---	---	---	---	---
Puerto Rico	3,358,000	---	---	---	---	---
Virgin Islands	95,900	---	---	---	---	---

Source U S Bureau of the Census *Current Population Reports*, Series P-25, Nos. 876 and 872, and official records

Table 6–4. Ratio of Census-Level Resident Population to Resident Population Adjusted for Estimated Net Census Undercount, by Age, Race, and Sex, United States: April 1, 1970

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	.9743	.9669	.9815	.9790	.9734	.9844	.9432	.9236	.9620	.9233	.9009	.9445
Under 5 years	.9649	.9633	.9668	.9759	.9742	.9776	.9110	.9087	.9134	.8986	.8961	.9012
Under 1 year	.9733	.9726	.9745	.9912	.9896	.9930	.8874	.8896	.8881	.8716	.8701	.8699
1-4 years	.9628	.9609	.9647	.9720	.9703	.9738	.9172	.9136	.9200	.9057	.9028	.9094
5-14 years	.9777	.9764	.9791	.9812	.9802	.9823	.9584	.9547	.9621	.9466	.9428	.9507
5-9 years	.9691	.9675	.9708	.9747	.9734	.9761	.9392	.9357	.9427	.9263	.9225	.9308
10-14 years	.9861	.9850	.9873	.9876	.9868	.9884	.9781	.9744	.9819	.9673	.9635	.9710
15-24 years	.9824	.9759	.9888	.9841	.9785	.9896	.9716	.9591	.9841	.9406	.9225	.9580
15-19 years	.9876	.9839	.9916	.9882	.9844	.9922	.9840	.9807	.9879	.9615	.9559	.9671
20-24 years	.9763	.9663	.9859	.9793	.9717	.9868	.9562	.9308	.9795	.9140	.8785	.9469
25-34 years	.9569	.9421	.9715	.9631	.9534	.9728	.9160	.8664	.9626	.8745	.8149	.9319
25-29 years	.9526	.9386	.9664	.9595	.9501	.9690	.9059	.8604	.9493	.8640	.8098	.9164
30-34 years	.9620	.9464	.9775	.9673	.9573	.9774	.9277	.8733	.9781	.8867	.8209	.9499
35-44 years	.9684	.9463	.9903	.9769	.9611	.9928	.9097	.8428	.9734	.8925	.8227	.9592
35-39 years	.9634	.9405	.9862	.9725	.9561	.9889	.9041	.8363	.9692	.8864	.8141	.9565
40-44 years	.9730	.9517	.9941	.9810	.9657	.9964	.9155	.8494	.9776	.8986	.8314	.9620
45-54 years	.9785	.9630	.9934	.9844	.9714	.9969	.9297	.8923	.9652	.9124	.8753	.9471
45-49 years	.9718	.9539	.9892	.9782	.9633	.9927	.9206	.8783	.9611	.9026	.8597	.9432
50-54 years	.9860	.9732	.9981	.9913	.9804	1.0014	.9404	.9089	.9699	.9239	.8938	.9515
55-64 years	.9731	.9705	.9754	.9779	.9763	.9793	.9307	.9182	.9402	.9195	.9080	.9295
55-59 years	.9754	.9696	.9804	.9818	.9773	.9861	.9188	.9026	.9319	.9052	.8914	.9175
60-64 years	.9706	.9715	.9697	.9733	.9752	.9718	.9454	.9376	.9502	.9371	.9290	.9441
65-74 years	1.0059	1.0048	1.0067	1.0014	.9997	1.0029	1.0513	1.0558	1.0476	1.0598	1.0670	1.0541
65-69 years	1.0143	1.0074	1.0199	1.0053	1.0000	1.0099	1.1046	1.0794	1.1264	1.1235	1.0997	1.1431
70-74 years	.9952	1.0013	.9908	.9966	.9993	.9946	.9804	1.0219	.9489	.9763	1.0212	.9434
75-84 years	.9452	.9648	.9326	.9484	.9619	.9398	.9044	.9951	.8457	.8702	.9527	.8182
75-79 years	.9441	.9628	.9317	.9489	.9623	.9400	.8876	.9688	.8337	.8598	.9398	.8074
80-84 years	.9471	.9686	.9342	.9476	.9613	.9394	.9346	1.0451	.8667	.8893	.9779	.8371
85 years and over	1.0140	1.0783	.9813	1.0101	1.0586	.9854	1.0558	1.2596	.9365	.9701	1.1219	.8923

Source: Computed from populations published by the U.S. Bureau of the Census in *Census of Population, 1970, General Population Characteristics*, Final Report PC(1)-B1, United States Summary, Table 52, and in *Current Population Reports*, Series P-25, No. 519, Table A-2.

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