

TECHNICAL NOTES

Sources and Completeness of Data

Data in this publication are from certificates and reports filed with the Center for Health Statistics (CHS) in the Alabama Department of Public Health according to Alabama Vital Statistics Laws. The State Registrar of Vital Records enforces the laws and administers the system of vital statistics. Birth, death, marriage and divorce certificates and fetal death and induced termination of pregnancy reports provide most of the information included in this publication. The statewide data for Alabama are also sent to the National Center for Health Statistics (NCHS) for inclusion in national reports and tabulations.

BIRTHS. If a birth occurs in a hospital, the birth certificate is filed by that institution with the CHS. Information on a birth certificate is obtained from a parent and from medical files for the mother and infant. Nearly 99 percent of the hospitals in Alabama use a birth certificate software package provided by the CHS to prepare birth certificates and electronically transmit data to CHS. If a birth occurs outside of a facility, the birth certificate is filed by the parent or someone else aware of the facts of birth. Formal testing of completeness of birth has not been done since 1950 when birth registration completeness for births occurring in hospitals was 99.6 percent. Since that time, additional checks have been added to ensure that all births are filed. Also, since the legal requirements for certified copies of births have increased, nearly 100 percent of all births are filed with CHS.

DEATHS. Mortality data are obtained from death certificates filed with CHS. In Alabama, the funeral director who first takes custody of the body is responsible for obtaining the demographic data from the next of kin and filing the death certificate. The medical certification is completed by the physician in charge of the care of the decedent for the illness or condition that resulted in death or by the county medical examiner or coroner. Registration of deaths is thought to be nearly 100 percent complete since the death certificate is needed by the next of kin for legal purposes. In addition, listings of deaths, which are independently prepared by funeral directors, coroners, hospitals, nursing homes and other institutions where deaths occur, are compared to certificates received to ensure that all deaths are filed.

MARRIAGES. The judge of probate in each county in Alabama issues a marriage license containing information obtained from the parties who intend to be married. After the marriage ceremony has taken place, the person who performs the marriage certifies the fact of marriage and returns the record to the judge of probate who forwards it to the CHS. Marriage data are believed to be nearly 100 percent complete since a license is needed prior to the ceremony being performed.

DIVORCES. Divorce certificates are prepared by the petitioner or his or her legal representative and presented to the clerk of a court where divorces are granted. The clerk of the court completes the information certifying the divorce and forwards the certificate to the CHS. While the law does require the divorce certificate to be filed before a divorce is granted, the filing of these records may not be as complete as other vital records since court procedures vary.

FETAL DEATHS. Reports of fetal death are required to be sent to the CHS if the fetus has advanced to or beyond the twentieth week of uterogestation. If the fetal death occurs in an institution, the person in charge of the institution or his or her representative is responsible for filing the report. If the fetal death occurs outside of an institution, the physician in attendance is responsible for filing the report. Since not all fetal deaths are medically attended, it is likely that there is some under reporting of these events. Evidence indicates that reporting may be better in metropolitan counties.

INDUCED TERMINATIONS OF PREGNANCY. Since 1993, reports of induced termination of pregnancy have been required for all events occurring in Alabama. If the induced termination of pregnancy occurs in an institution, the person in charge of the institution is required to file the report. If the induced termination of pregnancy occurs outside of an institution, the physician in attendance is required to file the report. From September 1987 to December 1992, the only reporting requirement for induced terminations of pregnancy was for events to women under 18 years of age as part of the Parental Consent Act. The degree of completeness for these reports is not known. However, if the CHS learns of institutions that are not aware of the reporting requirements, they are contacted and reporting is immediately initiated.

OUT OF STATE EVENTS. To have complete data for state residents, offices of vital statistics in all states have entered into an agreement to share data for statistical purposes. When a report or certificate is filed for a vital event that occurred in Alabama to a resident of another state or Canada, Alabama notifies that government.

Likewise, Alabama receives information and reports about events happening to Alabama residents in other states or in Canada. Data from these out of state events are included in the tabulations of resident data presented in this publication.

Most states send reports of out of state events to CHS on an ongoing basis, and these reports are believed to be quite complete since laws and procedures in other states are quite similar to Alabama's. The exception is reports of induced termination of pregnancy which have different reporting requirements in other states. Florida, a neighboring state, does not have a procedure for reporting Alabama resident induced terminations of pregnancy to CHS. Since it is unknown how many Alabama residents might have these events in neighboring states, the number of reported induced terminations of pregnancy for Alabama residents might be somewhat low.

Quality of Data

After reports and certificates are received at CHS, they are reviewed for all necessary information and signatures. Records that are incomplete or improperly completed are returned to the provider to be redone. If the information is accurate and consistent, the record is accepted into the official vital record files for Alabama.

Data for 99 percent of the births are keyed at the hospital into software containing edits and consistency checks and are electronically transmitted to CHS. Data for deaths, fetal deaths, induced terminations of pregnancy, marriages and divorces are coded and keyed into a computer database by CHS staff. Numerous edits and consistency checks are performed on all computer files to insure that the data are as accurate as possible. If data are inconsistent or missing, the provider is queried to try to verify information provided or to obtain the correct data. Additional procedures cross-check that all births and deaths are accounted for, particularly for infant deaths.

Residence Data

Unless specifically noted otherwise, data from vital events in this publication are reported according to the county or place of residence where the person, patient or decedent actually lived. Birth, fetal death, and induced termination of pregnancy statistics are reported according to the mother's residence. Deaths are reported by the residence of the decedent. The exceptions are marriage and divorce data that are reported according to the county where the marriage certificate was issued or the divorce was finalized.

Vital events occurring in other states and Canada to Alabama residents are also included in the residence data in this publication. See discussion under SOURCES AND COMPLETENESS OF DATA -- OUT OF STATE EVENTS.

Population Denominators

Population figures used in this publication to calculate rates for 2002 are from projections provided by the Alabama State Data Center, Center for Business and Economic Research, University of Alabama (CBER). The 2002 population figures were based on 2000 U. S. Census counts and projected forward. For 2000, actual Census counts were used for the denominators for the rates. For the years 1990 through 1999, population figures used were prepared by CBER projecting forward from the 1990 Census. Caution should be used in comparing rates over time, since the further away from the Census, the less accurate the populations and associated rates become. Based on 2000 Census data, the population projections for the late 1990s appear to be too low, and thus the rates for those years may be too high.

The rates in this publication may not be the same as those given in other publications if population data are from a different source. For example, for the years between decennial national censuses, the National Center for Health Statistics (NCHS) calculates crude rates using population *estimates* provided by US Census Bureau. Those figures are calculated in retrospect based on various housing, labor and vital statistics and are not the same as the figures used in CHS publications. Therefore, rates shown for Alabama vital events in NCHS publications may be slightly different from rates in this publication.

Race

Birth, fetal death, and induced termination of pregnancy statistics are reported according to the race of the mother since many of the health conditions related to these events are directly associated with the mother. Deaths are reported by the race of the decedent. Infant deaths are tabulated by the race of the infant (the decedent) while births, the denominator used for calculating infant mortality rates, are based on the race of the mother. Data for marriages and divorces are shown for both parties to the event.

For processing purposes, ten racial groupings are used: White, Black, American Indian,, Chinese, Japanese, Hawaiian, Filipino, other Asian or Pacific Islander, other entries and unknown race. However, for tables shown in this publication, these groups are consolidated into White and Black and Other. White encompasses Mexican, Puerto Rican, Cajun, Creole, and Other Caucasian. The Black and Other group includes Black, American Indian, Chinese,

Japanese, Hawaiian, Filipino, and Other Asian or Pacific Islander. Events of unknown race are included in the White category.

Population figures from the 2000 Census show the population for Alabama as 71.1 percent White, 26.0 percent black, 1.9 percent other races. One percent of the population reported two or more races and were included in the Black and Other population for tables shown in this publication.

Cause of Death

Alabama law requires the physician in charge of the care of the patient for the illness or condition that resulted in death to complete the medical certification section on the death certificate. The physician is requested to state the diseases or conditions that caused the death and other significant conditions contributing to death. If a death occurs with no physician in charge of the care, the county coroner or in a few counties, the medical examiner, is responsible for determining the cause of death.

CLASSIFICATION. For tabulation purposes, causes of death are coded according to the *International Classification of Diseases*¹ (ICD) which provides the essential ground rules for the coding and classification of cause-of-death data. The ICD was developed collaboratively between the World Health Organization (WHO) and ten international centers, one of which is housed at NCHS. The purpose of the ICD is to promote international comparability in the collection, classification, processing and presentation of health statistics. The United States is required to use the ICD under an agreement with WHO that has the force of an international treaty.

Besides being a classification system for the cause of death, the ICD includes coding rules. These rules identify the single condition on the death certificate considered most informative from a public health point of view, called the *underlying cause of death*. The underlying cause is the disease or injury initiating the sequence of events that leads directly to death or the circumstances of the accident or violence that produced the fatal injury.

Cause of death data in this publication were coded according to procedures established by the National Center for Health Statistics². Starting with death records for 1999, cause of death data were processed through computer software programs from NCHS which allow CHS staff to enter the literal information provided by the physician or coroner in the medical certification section of the death certificate. The software programs are written to apply WHO rules to select the underlying cause of death from all the conditions given on the death certificate. Tables in this publication contain the underlying cause of death as determined through these procedures.

TABULATION LISTS AND CAUSE OF DEATH RANKINGS. For dissemination and presentation of data, NCHS developed several tabulation lists which group causes of death codes into categories that are of public health interest and medical importance. The lists have increasing levels of detail or are for specific categories of death and are published in Part 9 of the NCHS Instruction Manual Series.³ Certain groups of causes on these lists are used for ranking causes of death to determine the leading causes of death. Starting with 1999 data, the list most widely used to identify and rank the leading causes of death in the United States is the *ICD-10 List of 113 Selected Causes of Death*. This list replaces the *ICD-9 List of 72 Selected Causes of Death* used from 1979 through 1998. For areas smaller than a state or nation, a *condensed list of selected causes* was developed to present cause of death data in Alabama.

CHANGE IN ICD. The ICD has been revised approximately once every 10 years to stay abreast with advances in medical science and to ensure the international comparability of health statistics. The tenth and most recent revision, known as the ICD-10, was first used to classify deaths that occurred on January 1, 1999 and after. The previous version, the ICD-9, was used from 1979 through 1998.

The ICD-10 is much more detailed with about 8,000 possible categories for cause of death compared with 4,000 categories in the previous version. For the first time, the ICD-10 uses alphanumeric codes. In the tenth revision of the ICD, cause of death titles have been changed and conditions have been regrouped. Some coding rules have also been changed. In addition, ICD-10 tabulation lists used in publications have also changed, so mortality data prepared under different revisions of the ICD may not be comparable.

¹World Health Organization. "International Statistical Classification of Diseases and Related Health Problems, Tenth Revision." Geneva: World Health Organization, 1992.

²National Center for Health Statistics. "NCHS Instruction Manual, Part 2a, Vital Statistics, Instructions for Classifying the Underlying Cause of Death." Hyattsville, Maryland: Public Health Service, published annually.

³National Center for Health Statistics, Centers for Disease Control and Prevention. "Instruction Manual Part 9, ICD-10 Cause-of-Death Lists for Tabulation Mortality Statistics, Effective 1999." Hyattsville, Maryland: October, 1997.

COMPARISON OF CAUSE OF DEATH DATA. Changes in moving to a new revision of the ICD can cause major discontinuities in trend data for certain causes of death. To understand the changes in mortality rates that are simply due to the new ICD revision, NCHS double codes a large sample of deaths under each revision to develop *comparability ratios*. This is simply the ratio of deaths coded under the new revision (ICD-10) divided by the number under the old revision (ICD-9) for a particular cause of death. These ratios are given in Robert Anderson, *et. al.*, *Comparability of Cause of Death between ICD-9 and ICD-10: Preliminary Estimates*, Hyattsville, MD, National Vital Statistics Reports, Volume 49, Number 2, May 18, 2001. Comparability ratios can be applied to specific cause of death groups that were coded under ICD-9 to see how many deaths in that specific group would result if those same deaths had been coded under the new ICD-10. Application of the comparability ratios is crucial in time trend analyses. For additional information on comparability ratios, see the NCHS web site at www.cdc.gov/nchs.

Handling of Unknowns

Items with a missing value or a response of "unknown" are shown as Not Stated in tables of frequency distributions and are included in totals and subtotals. However, for calculation of rates and ratios, "unknowns" are subtracted from denominators before calculations are made.

The only exceptions to this rule are for race and sex. Events with race "unknown" are included with "white" for tabulation purposes. If sex cannot be determined, sex is considered male if the day of the event is odd and female if the day is even.

Data Techniques

Data in this publication are generally presented as frequencies, rates, ratios and percentages. Frequency distributions tell how many times an event occurred for a particular population. For purposes of comparison rates, ratios and percentages are provided to standardize the figures. A ratio is a comparison of two quantities and is generally expressed as a fraction. A rate is the number of items having a certain characteristic divided by the total number of items. Rates are generally expressed to a standard base of 100, 1,000 or 100,000. Percentages are rates standardized to a base of 100.

Demographic rates make all populations equal in size. Demographic rates such as the death rate and birth rate are calculated by dividing the number of events in a given period by the population at risk during that period. Thus, rates give the number of events per person, or the average. By standardizing all populations to the same size, we eliminate one factor that makes comparisons among areas difficult.

The base of a demographic rate may be the total population or a sub population. Rates based on the total population are called crude rates. Others are called specific rates, such as age-specific rates used for children or teenaged populations or the sex-specific rate for prostate cancer. For information on specific calculations, see the section on FORMULAS.

Small Number Limitations

When using vital events data for studying small geographic areas or for examining specific medical or social factors, the number of events reported in a given year may be very small. Understanding the statistical limitations of small numbers is important in conducting analyses. Any time something is measured, error is almost inevitable. Error can be based on the accuracy of the reports, or alternately, on the number of the events or the size of the population. Some error is random, and when the numbers are very large, random error does not affect the usefulness of the data. However, when the number of vital events is very small or the population of the area is very low, random errors in data collection, or even randomly occurring events, can cause drastic fluctuations in rates.

One way to counteract random error is to increase the number of years or enlarge the area being studied. Otherwise calculations may be correct, but of very limited practical value. In this publication, rates are given regardless of their stability; however, for rates based on very small numbers, warnings are issued in the footnotes.