

## ***Health, United States, 2018 Appendixes***

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# Appendix I. Data Sources

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*Health, United States* consolidates the most current data on the health of the population of the United States, the availability and use of health care resources, and health care expenditures. Information was obtained from the data files and published reports of many federal government, private, and global agencies and organizations. In each case, the sponsoring agency or organization collected data using its own methods and procedures. Therefore, data in this report may vary considerably with respect to source, method of collection, definitions, and reference period.

Although a detailed description and comprehensive evaluation of each data source are beyond the scope of this appendix, readers should be aware of the general strengths and weaknesses of the different data collection systems shown in *Health, United States*. For example, population-based surveys are able to collect socioeconomic data and information on the impact of an illness, such as limitation of activity. These data are limited by the amount of information a respondent remembers or is willing to report. For example, a respondent may not know detailed medical information, such as a precise diagnosis or the type of medical procedure performed, and therefore cannot report that information. In contrast, records-based surveys, which collect data from physician and hospital records, usually contain good diagnostic information but little or no information about the socioeconomic characteristics of individuals or the impact of illnesses on individuals.

Different data collection systems may cover different populations, and understanding these differences is critical to interpreting the resulting data. Data on vital statistics and national expenditures cover the entire population. However, most data on morbidity cover only the civilian noninstitutionalized population, so may not include data for military personnel, who are usually young; for institutionalized people, including the prison population, who may be of any age; or for nursing home residents, who are usually older.

All data collection systems are subject to error, and records may be incomplete or contain inaccurate information. Respondents may not remember essential information, a question may not mean the same thing to different respondents, and some institutions or individuals may not respond at all. It is not always possible to measure the magnitude of these errors or their effect on the data. Where possible, table notes describe the universe and method of data collection, to assist users in evaluating data quality.

Some information is collected in more than one survey, and estimates of the same statistic may vary among surveys because of different survey methodologies, sampling frames, questionnaires, definitions, and tabulation categories. For example, cigarette use is measured by the National Health Interview Survey, the National Survey on Drug Use and

Health and the National Youth Tobacco Survey. These surveys use slightly different questions, cover persons of differing ages, and interview in diverse settings (e.g., at school compared with at home), so estimates may differ.

Overall estimates generally have relatively small sampling errors, but estimates for certain population subgroups may be based on a small sample size and have relatively large sampling errors. Numbers of births and deaths from the National Vital Statistics System represent complete counts (except for births in those states where data are based on a 50% sample for certain years). Therefore, these data are not subject to sampling error. However, when the figures are used for analytical purposes, such as the comparison of rates over a period, 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. When the number of events is small and the probability of such an event is rare, estimates may be unstable, and considerable caution must be used in interpreting the statistics. Estimates that are unreliable because of large sampling errors or small numbers of events are noted with asterisks in tables, and the criteria used to determine unreliable estimates are indicated in an accompanying footnote.

In this appendix, government data sources are listed alphabetically by data set name, and private and global sources are listed separately. To the extent possible, government data systems are described using a standard format. The “Overview” section is a brief, general statement about the purpose or objectives of the data system. “Coverage” describes the population or events that the data system covers: for example, residents of the United States, the noninstitutionalized population, persons in specific population groups, or other entities that are included in the survey or data system. “Methodology” presents a short description of the methods used to collect the data. “Sample Size and Response Rate” provides these statistics for surveys. “Issues Affecting Interpretation” describes major changes in the data collection methodology or other factors that must be considered when analyzing trends shown in *Health, United States*: for example, a major survey redesign that may introduce a discontinuity in the trend. For additional information about the methodology, data files, and history of a data source, consult the “References” and “For More Information” sections that follow each summary.

# Government Sources

## National Health and Nutrition Examination Survey (NHANES)

### National Center for Health Statistics (NCHS)

*Overview.* NHANES is designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations. NHANES collects data on the prevalence of chronic diseases and conditions (including undiagnosed conditions) and on risk factors such as obesity, elevated serum cholesterol levels, hypertension, diet and nutritional status, and numerous other measures.

*Coverage.* NHANES III, conducted during 1988–1994, and the continuous NHANES, which began in 1999, target the civilian noninstitutionalized U.S. population.

*Methodology.* NHANES includes clinical examinations, selected medical and laboratory tests, and self-reported data. NHANES interviews persons in their homes and conducts medical examinations in a mobile examination center (MEC), including laboratory analysis of blood, urine, and other tissue samples. Medical examinations and laboratory tests follow very specific protocols and are standardized as much as possible to ensure comparability across sites and providers. During 1988–1994, as a substitute for the MEC examinations, a small number of survey participants received an abbreviated health examination in their homes if they were unable to come to the MEC.

The survey for NHANES III was conducted from 1988 to 1994 using a stratified, multistage probability design to sample the civilian noninstitutionalized U.S. population. About 40,000 persons aged 2 months and over were selected and asked to complete an extensive interview and a physical examination. Participants were selected from households in 81 survey units across the United States. Children aged 2 months to 5 years, persons aged 60 and over, black persons, and persons of Mexican origin were oversampled to provide precise descriptive information on the health status of selected population groups in the United States.

Beginning in 1999, NHANES became a continuous annual survey, collecting data every year from a representative sample of the civilian noninstitutionalized U.S. population, newborns and older, through in-home personal interviews and physical examinations in the MEC. The sample design is a complex, multistage, clustered design using unequal probabilities of selection. The first-stage sample frame for continuous NHANES during 1999–2001 was the list of primary sampling units (PSUs) selected for the design of the National Health Interview Survey. Typically, an NHANES PSU is a county. For 2002, an independent sample of PSUs (based on current census data) was selected. This independent design was used for the period 2002–2006. In 2007–2010 and 2011–2014, the sample was redesigned. For 1999, because of a delay in the start of data collection, 12 distinct PSUs were in the annual sample. For each year during 2000–2016, 15

PSUs were selected. The within-PSU design involves forming secondary sampling units that are nested within census tracts, selecting dwelling units within secondary units, and then selecting sample persons within dwelling units. Selection of the final sample person involves differential probabilities of selection according to the demographic variables of sex (male or female), race and ethnicity, and age. Because of the differential probabilities of selection, dwelling units are screened for potential sample persons.

Beginning in 1999, NHANES oversampled low-income persons, adolescents aged 12–19, persons aged 60 and over, black or African American persons, and persons of Mexican origin. The sample for data years 1999–2006 was not designed to give a nationally representative sample for the total Hispanic population residing in the United States. Starting with 2007–2010 data collection, all Hispanic persons were oversampled, not just persons of Mexican origin, and adolescents were no longer oversampled. In 2011–2014, the sampling design was changed and the following groups were oversampled: Hispanic persons; non-Hispanic black persons; non-Hispanic Asian persons; non-Hispanic white and other persons at or below 130% of poverty; and non-Hispanic white and other persons aged 80 and over. In 2015–2016, the sampling design was revised again, changing the cut-point for low-income oversampling from at or below 130% of poverty to at or below 185% of poverty. For more information on the sample design for 1999–2006, see: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_155.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_155.pdf); for 2007–2010, see: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_160.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_160.pdf); for 2011–2014, see: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_162.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_162.pdf); and for 2015–2016, see: <https://www.cdc.gov/nchs/nhanes/continuousnhanes/Overview.aspx?BeginYear=2015>.

The estimation procedure used to produce national statistics for all NHANES involved inflation by the reciprocal of the probability of selection, adjustment for nonresponse, and poststratified ratio adjustment to population totals. Sampling errors also were estimated, to measure the reliability of the statistics.

*Sample Size and Response Rate.* Over the 6-year survey period of NHANES III, 39,695 persons were selected; the household interview response rate was 86% (33,994), and the medical examination response rate was 78% (30,818). For NHANES 1999–2000 to NHANES 2011–2012, the number of persons selected ranged from 12,160 to 13,431. The percentage who were interviewed ranged from 73% to 84%, while the percentage who were examined ranged from 70% to 80%. For NHANES 2013–2014, a total of 14,332 persons were eligible, of which 71% (10,175) were interviewed and 68% (9,813) completed the health examination component. For NHANES 2015–2016, a total of 15,327 persons were eligible, of which 61% (9,971) were interviewed and 59% (9,544) completed the health examination component. For more detailed information on unweighted NHANES response rates and response weights using sample size weighted to Current Population Survey population totals, see: <https://www.cdc.gov/nchs/nhanes/ResponseRates.aspx>.

*Issues Affecting Interpretation.* Data elements, laboratory tests performed, and the technological sophistication of medical examination and laboratory equipment have changed over time. Therefore, trend analyses should carefully examine how specific data elements were collected across the various survey years. Data files are revised periodically. If the file changes are minor and the impact on estimates is small, then the data are not revised in *Health, United States*. Major data changes are incorporated.

Periodically, NHANES changes its sampling design to oversample different groups. Because the total sample size in any year is fixed due to operational constraints, sample sizes for the other oversampled groups (including Hispanic persons and nonlow-income white and other persons) were decreased. Therefore, trend analyses on demographic subpopulations should be carefully evaluated to determine if the sample sizes meet the NHANES Analytic Guidelines. In general, any 2-year data cycle in NHANES can be combined with adjacent 2-year data cycles to create analytic data files based on 4 or more years of data, in order to improve precision. However, because of the sample design change in 2011–2012, the data user should be aware of the implications if these data are combined with data from earlier survey cycles. Users are advised to examine their estimates carefully to see if the 4-year estimates (and sampling errors) are consistent with each set of 2-year estimates.

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For more information, see the NHANES website at: <https://www.cdc.gov/nchs/nhanes/index.htm>.

## National Health Expenditure Accounts (NHEA)

### Centers for Medicare & Medicaid Services (CMS)

*Overview.* NHEA provides estimates of aggregate health care expenditures in the United States from 1960 onward. NHEA contains all of the main components of the health care system within a unified, mutually exclusive, and exhaustive structure. The accounts measure spending for health care in the United States by type of good or service delivered (e.g., hospital care, physician and clinical services, or retail prescription drugs) and by the source of funds that pay for that care (e.g., private health insurance, Medicare, Medicaid, or out of pocket). A consistent set of definitions is used for health care goods and services and for sources of funds that finance health care expenditures, allowing for comparisons over time.

*Methodology.* NHEA estimates health care spending using an expenditures approach to national economic accounting. NHEA includes all of the main components of the health care system within a comprehensive and mutually exclusive structure. Expenditures are estimated for the payers, as well as the categories of medical goods and services. A common set of definitions allows comparison among categories and over time. In addition, estimates are benchmarked to revenue estimates from the Census Bureau's quinquennial Economic Census.

An assortment of government and private sources are used to create NHEA. In addition to the Economic Census, government sources include data from the Census Bureau's Services Annual Survey, the Bureau of Economic Analysis, the National Income and Product Accounts, and Medicare claims data. Private data sources include the American Hospital Association's Annual Survey and the Kaiser Health Research and Educational Trust Employer Health Benefits Survey.

For example, private health insurance spending for health care goods and services is derived using data from the Census Bureau, the American Medical Association, the American Hospital Association, IQVIA (formerly IMS Health), and the Medical Expenditure Panel Surveys (MEPS) data from the Agency for Healthcare Research and Quality. For a matrix of data sources used for NHEA, see Exhibit 4 of [National Health Expenditure Accounts: Methodology Paper, 2017](#).

*Issues Affecting Interpretation.* Every 5 years, NHEA undergoes a comprehensive revision that includes the incorporation of newly available source data, methodological and definitional changes, and benchmark estimates from the Economic Census. During these comprehensive revisions, the entire NHEA time series is opened for revision.

### References

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For more information, see the CMS National Health Expenditure Accounts website at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html>.

## National Health Interview Survey (NHIS)

### National Center for Health Statistics (NCHS)

*Overview.* Data from the NHIS are used to monitor the health of the U.S. population on a broad range of health topics by many demographic and socioeconomic characteristics. During household interviews, NHIS collects information on the demographic and socioeconomic characteristics of respondents, in addition to information on activity limitation, illnesses, injuries, chronic conditions, health insurance coverage (or lack thereof), utilization of health care, and other health topics.

*Coverage.* The survey covers the civilian noninstitutionalized population of the United States. Among those excluded are patients in long-term care facilities, persons on active duty with the Armed Forces (although their civilian family members are included), incarcerated persons, and U.S. nationals living in foreign countries.

*Methodology.* NHIS is a cross-sectional household interview survey. Sampling and interviewing are continuous throughout each year. The sample design follows a multistage area probability design that permits the representative sampling of households and noninstitutional group quarters (e.g., college dormitories). The sample design for NHIS is redesigned approximately every 10 years to better measure the changing U.S. population and to meet new survey objectives. A new sample design was implemented in 2016.

The current 2016 sample design has many similarities to the design that was in place from 2006 to 2015, but there are some key differences. Sample areas were reselected to take into account changes in the distribution of the U.S. population since 2006, when the previous sample design was first implemented. Commercial address lists were used

as the main source of addresses, rather than field listing; and the oversampling procedures for black, Hispanic, and Asian persons that were a feature of the previous sample design were not implemented in 2016. However, persons aged 65 or over who are black, Hispanic, or Asian continue to have a higher chance of being selected for the sample adult selection stage.

The first stage of the current 2016 sample design consists of a sample of 319 PSUs drawn from approximately 1,700 geographically defined PSUs, with some PSUs in each of the 50 states and the District of Columbia.

In the current 2016 sample design, PSUs with the largest populations (e.g., the New York City metropolitan area), also called self-representing (SR) PSUs, are sampled with certainty. The set of PSUs with smaller populations, called nonself-representing (NSR) PSUs, is stratified geographically by state. Independently within each state, a systematic sample of address clusters was selected. The NSR PSUs where these address clusters were located were then considered to be in the sample. Similarly, independently within each state, a systematic sample of address clusters was selected from the state's SR PSUs.

The 2016 NHIS sampling frame consists of three nonoverlapping parts: the unit frame (a list of addresses); the area frame (geographic areas without city-style addresses or where the unit frame was not considered to be a sufficient sampling resource); and the college dormitory frame.

The total NHIS sample is subdivided into four separate panels such that each panel (and any combination of the panels) is representative of the U.S. civilian noninstitutionalized population. This design feature has a number of advantages, including flexibility for the total sample size.

The current NHIS questionnaire, implemented in 1997, has two basic parts: a Core and one or more supplements that vary by year. The Core remains largely unchanged from year to year and allows for trend analysis and for data from more than one year to be pooled to increase the sample size for analytic purposes.

NHIS consists of four components: the Household Composition, the Family Core, the Sample Adult, and the Sample Child. The Household Composition section collects basic demographic and relationship information about everyone in the household. The Family Core, which is administered separately for each family in the household, collects information on everyone in the family. From each family participating in NHIS, one adult is randomly selected to participate in the Sample Adult questionnaire. For families with children under age 18, one child is randomly selected to participate in the Sample Child questionnaire. For children, information is provided by a knowledgeable family member aged 18 or over residing in the household. Because some health issues are different for children and adults, these two questionnaires differ in some items, but both collect basic information on health status, use of health care services, health conditions, and health behaviors.

NHIS implemented a redesigned survey in January 2019. The redesign is intended to improve the measurement

of covered health topics, reduce respondent burden by shortening the length of the questionnaire, harmonize overlapping content with other federal health surveys, establish a long-term structure of ongoing and periodic topics, and incorporate advances in survey methodology and measurement.

**Sample Size and Response Rate.** The NHIS sample size varies from year to year. It may be reduced for budgetary reasons or may be augmented if supplementary funding is available. The normal annual sample size (i.e., the number of households or persons for whom data are collected and publicly released) for the previous 2006–2015 sample design and for the new 2016 sample design is about 35,000 households containing about 87,500 persons.

In 2011–2016, the NHIS sample size was augmented in 32 states and the District of Columbia to increase the number of states for which reliable state-level estimates can be produced. Each year during 2011–2016, the sample size was augmented between 13% and 27%. In contrast to previous years, there was no sample size augmentation in 2017. In 2017, the NHIS sample included 78,132 persons, with 26,742 persons participating in the Sample Adult questionnaire and 8,845 participating in the Sample Child questionnaire. In 2017, the total household response rate was 66.5%. The final response rate in 2017 was 53.0% for the Sample Adult file and 60.6% for the Sample Child file.

**Issues Affecting Interpretation.** As part of the 1997 questionnaire redesign, some basic concepts were changed, and other concepts were measured in different ways. For some questions, there was a change in the reference period. Also in 1997, the collection methodology changed from paper-and-pencil questionnaires to computer-assisted personal interviewing. Some indicators presented in *Health, United States* begin with 1997 data because the redesign caused a break in the trend. Also, starting with *Health, United States, 2005*, estimates for 2000–2002 were revised to use 2000-based weights and differ from previous editions of *Health, United States* that used 1990-based weights for those data years. The weights available in the public-use NHIS files for 2000–2002 are 1990-based. Data for 2003–2011 use weights derived from the 2000 Census. Data for 2012 and beyond use weights derived from the 2010 Census. In 2006–2010, the sample size was reduced, and this is associated with slightly larger variance estimates than in other years when a larger sample was fielded. Starting in 2010, a geographic nonresponse adjustment was made to both the sample adult weight and the sample child weight; see Moriarity.

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[Health\\_Statistics/NCHS/Dataset\\_Documentation/NHIS/2017/srvydesc.pdf](https://www.cdc.gov/nchs/dataset_documentation/nhis/2017/srvydesc.pdf)

For more information, see the NHIS website at: <https://www.cdc.gov/nchs/nhis.htm>.

## National HIV Surveillance System

### Centers for Disease Control and Prevention (CDC), National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP)

**Overview.** Human immunodeficiency virus (HIV) surveillance data are used to detect and monitor cases of HIV infection in the United States, evaluate epidemiologic trends, identify unusual cases requiring follow-up, and inform public health efforts to prevent and control the disease. Data collected on persons with diagnosed HIV infection include age, sex, race, ethnicity, transmission category, and geographic region.

**Coverage.** All 50 states, the District of Columbia (D.C.), and 6 U.S.-dependent areas (American Samoa, Guam, Northern Mariana Islands, Puerto Rico, Republic of Palau, and the U.S. Virgin Islands) report confirmed diagnoses of HIV infection to CDC using a uniform surveillance case definition and case report form. As of April 2008, all reporting areas had implemented confidential, name-based HIV infection reporting and agreed to participate in CDC's National HIV Surveillance System. *Health, United States* only presents data for the 50 states and D.C.

**Methodology.** The surveillance programs of local, territorial, and state health departments collect information, on demographic, transmission risk, and clinical information that also includes routine reporting of laboratory tests for HIV infection, using a standard confidential case report form. This data is then transmitted electronically, without personal identifiers, to the CDC National HIV Surveillance System (NHSS). HIV surveillance includes de-identified case report data from 50 states, D.C., and six dependent areas.

**Issues Affecting Interpretation.** Although the completeness of reporting of cases of HIV infection to state and local health departments differs by geographic region and patient population, studies conducted by state and local health departments indicate that the reporting of cases of HIV infection in most areas of the United States is at least 85% complete.

In 2014, the criteria used to define HIV diagnoses were updated. Cases diagnosed through 2013 were classified according to the 2008 HIV case definition and cases diagnosed after 2013 were classified according to the new updated definition. The 2014 case definition is similar to the 2008 definition except for the following: (1) inclusion of criteria for stage 0, (2) the inclusion of CD4 lymphocyte testing for stage 3 in children, and (3) changes in the cutoffs for CD4 percentage of total lymphocytes used for classification of stages 1 and 2 in persons aged 6 years and older. See [Appendix II](#), Human immunodeficiency virus (HIV)

disease and Acquired immunodeficiency syndrome (AIDS) for discussion of HIV diagnoses reporting definitions and other issues affecting interpretation of trends.

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For more information, see the NCHSTP website at: <https://www.cdc.gov/nchstp>.

## National Immunization Surveys (NIS)

### Centers for Disease Control and Prevention (CDC), National Center for Immunization and Respiratory Diseases (NCIRD)

*Overview.* NIS is continuing nationwide telephone sample surveys to monitor vaccination coverage rates among children aged 19–35 months (NIS–Child) and among teenagers aged 13–17 years (NIS–Teen). Data collection for children aged 19–35 months started in 1994, and data collection for teenagers aged 13–17 years started in 2006.

*Coverage.* Children aged 19–35 months and adolescents aged 13–17 years in the civilian noninstitutionalized population are represented in this survey. Estimates of vaccine-specific coverage are available for the country, the 50 states, the District of Columbia, and some U.S. territories.

*Methodology.* NIS is a nationwide telephone sample survey of households with age-eligible children. The survey uses a two-phase sample design. First, a random-digit-dialing sample of telephone numbers is drawn. When households with at least one age-eligible child are contacted, the interviewer collects demographic and access-related information on all age-eligible children, the mother, and the household, and obtains permission to contact the children's vaccination providers. Second, identified providers are sent vaccination history questionnaires by mail. Final weighted estimates are adjusted for households without telephones and for nonresponse. All vaccination coverage estimates are based on provider-reported vaccination histories. NIS–Teen followed the same sample design and data collection procedures as NIS, except that only one age-eligible adolescent was selected from each screened household for data collection.

Starting in 2011, the NIS sampling frame was expanded from a single-landline frame to dual-landline and cellular telephone sampling frames. This change increased the representativeness of the sample characteristics but had little effect on the final 2011 NIS and NIS–Teen national estimates of vaccination coverage overall and when stratified by poverty status. See details of the dual-frame sample design in the annual NIS data user's guide on the NIS website, available from: <https://www.cdc.gov/vaccines/imz-managers/nis/datasets.html>.

*Sample Size and Response Rate.* In 2017, the overall Council of American Survey Research Organizations (CASRO) response rate for NIS was 26.1%. Response rates for the landline and cellular telephone samples were 51.9% and 25.0%, respectively. Of the 2,235 age-eligible children with completed household interviews from the landline sample, 1,279 (57.2%) had adequate provider data. From the cellular telephone sample, 14,054 of the 26,230 eligible children with completed household interviews had adequate provider data (53.6%).

The overall CASRO response rate for the 2017 NIS–Teen was 25.7%. Response rates for the landline and cellular telephone samples were 51.5% and 23.5%, respectively. Of the 6,663 age-eligible adolescents with completed household interviews from the landline sample, 3,572 (53.6%) had adequate provider data. From the cellular telephone sample, 17,377 of the 36,928 (47.1%) eligible adolescents with completed household interviews had adequate provider data.

*Issues Affecting Interpretation.* The findings in recent years are subject to several limitations. Data year 2011 was the first year that NIS and NIS–Teen used a dual-frame sampling scheme that included landline and cellular telephone households. Estimates from 2011 and subsequent years might not be comparable with those from prior to 2011, when surveys were conducted via landline telephone only. NIS is a telephone survey, and statistical adjustments might not compensate fully for nonresponse and for households without landline telephones prior to 2011. Underestimates of vaccination coverage might have resulted in exclusive use of provider-reported vaccination histories because completeness of records is unknown.

Before January 2009, NIS did not distinguish between Hib vaccine production types; therefore, children who received three doses of a vaccine product that requires four doses were misclassified as fully vaccinated. For more information, see: CDC. Changes in measurement of *Haemophilus influenzae* serotype b (Hib) vaccination coverage—National Immunization Survey, United States, 2009. *MMWR Morb Mortal Wkly Rep* 59(33):1069–72. 2010. Available from: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5933a3.htm>.

Starting in 2014, NIS–Teen defined an adolescent's vaccination record as having adequate provider data if that adolescent had vaccination history data from one or more of the named vaccination providers, or if the parent reported that the adolescent was completely unvaccinated. Prior to 2014, the adequate provider data definition had more criteria, and it was based on a comparison of provider report of vaccination history with parental report of vaccination history, either by shot card report or recall.

To assess the effect of the change in the adequate provider definition criteria on vaccination coverage estimates, NIS recomputed estimates from the 2006–2013 survey. In general, 2013 NIS–Teen vaccination coverage estimates using the revised adequate provider data definition were different, and generally lower, than original 2013 NIS–Teen estimates. Differences between revised

and original 2013 national vaccination estimates ranged from –0.1 percentage point to –2.2 percentage points. For more information on the revised adequate provider data criteria, see: <https://www.cdc.gov/vaccines/imz-managers/coverage/nis/teen/apd-report.html>, and for revised 2013 estimates based on the 2014 criteria, see: Reagan-Steiner S, Yankey D, Jeyarajah J, Elam-Evans LD, Singleton JA, Curtis CR, et al. National, regional, state, and selected local area vaccination coverage among adolescents aged 13–17 years—United States, 2014. *MMWR Morb Mortal Wkly Rep* 64(29):784–92. 2015. Available from: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6429a3.htm>. Because of the revision in the adequate provider definition, NIS–Teen vaccination coverage estimates for 2013 and beyond cannot be directly compared with previously published 2006–2013 NIS–Teen survey vaccination coverage estimates based on the previous adequate provider definition.

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Walker TY, Elam-Evans LD, Yankey D, Markowitz LE, Williams CL, Mbaeyi SA, et al. National, regional, state, and selected local area vaccination coverage among adolescents aged 13–17 years—United States, 2017. *MMWR Morb Mortal Wkly Rep* 67(33): 909–917. 2017. Available from: <https://www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6733a1-H.pdf>.

## National Income and Product Accounts (NIPA)

### Bureau of Economic Analysis (BEA)

*Overview.* NIPA are a set of economic accounts that provide detailed measures of the value and composition of national output and the incomes generated in the production of that output. Essentially, NIPA provides a detailed snapshot of the myriad transactions that make up the economy, such as buying and selling goods and services, hiring of labor, investing, renting property, and paying taxes. NIPA estimates show U.S. production, distribution, consumption, investment, and saving.

The best-known NIPA measure is the gross domestic product (GDP), which is defined as the market value of the goods, services, and structures produced by the economy in a given period. NIPA calculates GDP as the sum of the final expenditure components: personal consumption expenditures, private fixed investment, change in private inventories, net exports of goods and services, government spending, and government investment. However, GDP is just one of many economic measures presented in NIPA. Another key NIPA indicator presented in *Health, United States* is the

implicit price deflator for GDP.

The conceptual framework of NIPA is illustrated by seven summary accounts: the domestic income and product account, the private enterprise income account, the personal income and outlay account, the government receipts and expenditures account, the foreign transactions current account, the domestic capital account, and the foreign transactions capital account. These summary accounts record a use (or expenditure) in one account for one sector and a corresponding source (or receipt) in an account of another sector or of the same sector. This integrated system provides a comprehensive measure of economic activity in a consistently defined framework without double counting.

*Coverage.* Source data for NIPA domestic estimates cover all 50 states and the District of Columbia. The U.S. national income and product statistics were first presented as part of a complete and consistent double-entry accounting system in the summer of 1947.

*Methodology.* NIPA estimates are revised quarterly, annually, and quinquennially. For GDP and most other NIPA series, a set of three current quarterly estimates is released each year. Quarterly estimates provide the first look at the path of U.S. economic activity. Annual revisions of NIPA are usually carried out each summer. These revisions incorporate source data that are based on more extensive annual surveys, on annual data from other sources, and on later revisions to the monthly and quarterly source data, and they generally cover the 3 previous calendar years. Comprehensive revisions are carried out at about 5-year intervals and may result in revisions that extend back many years. These estimates incorporate all of the best available source data, such as data from the quinquennial U.S. Economic Census.

NIPA measures are built up from a wide range of source data using a variety of estimating methods. To ensure consistency and accuracy, NIPA uses various adjustment and estimation techniques to estimate data. Three general types of adjustments are made to the source data that are incorporated into the NIPA estimates. The first consists of adjustments that are needed so that the data conform to appropriate NIPA concepts and definitions. The second type of adjustment involves filling gaps in coverage. The third type of adjustment involves time of recording and valuation. Source data must be adjusted occasionally to account for special circumstances that affect the accuracy of the data. For example, quarterly and monthly NIPA estimates are adjusted seasonally at the detailed-series level when the series demonstrate statistically significant seasonal patterns. Source data may also be used as indicators to extrapolate annual estimates. For more information, see “An introduction to the National Income and Product Accounts. Methodology papers: U.S. National Income and Product Accounts,” available from: [https://www.bea.gov/scb/pdf/national/nipa/methpap/mpi1\\_0907.pdf](https://www.bea.gov/scb/pdf/national/nipa/methpap/mpi1_0907.pdf); and “Concepts and methods of the U.S. National Income and Product Accounts,” available from: <https://www.bea.gov/sites/default/files/methodologies/nipa-handbook-all-chapters.pdf>.

*Issues Affecting Interpretation.* NIPA source data and estimates are revised frequently. Data are released at different times, estimates are updated as they become available, new concepts and definitions are incorporated, and source data may change due to improvements in collection and new methodologies. As a result, major estimates, such as GDP and its major components, undergo frequent revision, and historical data are changed. For more information, see the BEA (NIPA) website at: [https://apps.bea.gov/iTable/index\\_nipa.cfm](https://apps.bea.gov/iTable/index_nipa.cfm).

### Reference

U.S. Bureau of Economic Analysis. A guide to the National Income and Product Accounts of the United States. 2017. Available from: <https://www.bea.gov/national/pdf/nipaguid.pdf>.

For more information, see the BEA website at: <https://www.bea.gov/national/index.htm>.

**National Medical Expenditure Survey (NMES)**—See [Appendix I](#), Medical Expenditure Panel Survey (MEPS).

## National Notifiable Diseases Surveillance System (NNDSS)

### Centers for Disease Control and Prevention (CDC)

*Overview.* NNDSS is a nationwide collaboration that enables all levels of public health (local, state, territorial, federal, and international) to share health information to monitor, control, and prevent the occurrence and spread of state-reportable and nationally notifiable infectious and some noninfectious diseases and conditions. NNDSS is a multifaceted program that includes the surveillance system for collection, analysis, and sharing of health data, resources, and information about policies and standards, at the local, state, and national levels. NNDSS provides weekly provisional and annual finalized information on the occurrence of diseases defined as notifiable by the Council of State and Territorial Epidemiologists (CSTE). Data include incidence of nationally notifiable reportable diseases, which are reported using uniform surveillance case definitions.

*Coverage.* Notifiable disease reports are received from health departments in the 50 states, 5 territories, the District of Columbia, and New York City. Policies for reporting notifiable disease cases can vary by disease or reporting jurisdiction, depending on case status classification (i.e., confirmed, probable, or suspect).

*Methodology.* CDC, in partnership with CSTE, administers NNDSS. Reportable disease surveillance is conducted by public health practitioners at local, state, and national levels to support disease prevention and control.

Data on a subset of reportable conditions that have been designated nationally notifiable are then submitted to CDC. The system also provides annual summaries of the finalized data. CSTE and CDC annually review the status of national notifiable disease surveillance and recommend additions or deletions to the list of nationally notifiable diseases, based on the need to respond to emerging priorities. For example, Zika virus disease and Zika virus infection became nationally notifiable in 2016. However, reporting nationally notifiable diseases to CDC is voluntary. Because reporting is currently mandated by law or regulation only at the local and state levels, the list of diseases that are considered reportable varies by state. For example, reporting of coccidioidomycosis to CDC is not done by some states in which this disease is not reportable to local or state authorities.

State epidemiologists report cases of nationally notifiable diseases to CDC, which tabulates and publishes these data in *Morbidity and Mortality Weekly Reports* (MMWR) and in *Summary of Notifiable Diseases, United States* (titled *Annual Summary* before 1985). Beginning in 2016, national notifiable disease data are released via the NNDSS website, available from: <https://www.cdc.gov/nndss/infectious-tables.html>.

*Issues Affecting Interpretation.* NNDSS data must be interpreted in light of reporting practices. Some diseases that cause severe clinical illness (e.g., meningococcal disease, plague, and rabies) are likely reported accurately if diagnosed by a clinician. However, persons who have diseases that are clinically mild and infrequently associated with serious consequences (e.g., salmonellosis) may not seek medical care from a health care provider. Even if these less-severe diseases are diagnosed, they are less likely to be reported.

The degree of completeness of data reporting is also influenced by the diagnostic facilities available, the control measures in effect, public awareness of a specific disease, and the interests, resources, and priorities of state and local officials responsible for disease control and public health surveillance. Finally, factors such as changes in case definitions for public health surveillance, introduction of new diagnostic tests, or discovery of new disease entities can cause changes in disease reporting that are independent of the true incidence of disease.

### References

Centers for Disease Control and Prevention. MMWR: Summary of notifiable infectious diseases. Available from: [https://www.cdc.gov/mmwr/mmwr\\_nd/index.html](https://www.cdc.gov/mmwr/mmwr_nd/index.html).

Centers for Disease Control and Prevention. National Notifiable Diseases Surveillance System. 2016 annual tables of infectious disease data. 2017. Available from: [https://wonder.cdc.gov/nndss/nndss\\_annual\\_tables\\_menu.asp](https://wonder.cdc.gov/nndss/nndss_annual_tables_menu.asp).

For more information, see the NNDSS website at: <https://www.cdc.gov/nndss/>.

# National Study of Long-Term Care Providers (NSLTCP)

## National Center for Health Statistics (NCHS)

*Overview.* NSLTCP is a biennial study to monitor the major sectors of paid, regulated long-term care services. NSLTCP uses administrative data from the Centers for Medicare & Medicaid Services (CMS) about the home health, nursing home, and hospice sectors and collects survey data on the residential care community and adult day services sectors. Information includes the supply, organizational characteristics, staffing, and services offered by providers of long-term care services and the demographic, health, and functional status of users of these services. NSLTCP replaces NCHS' periodic National Nursing Home Survey and National Home and Hospice Care Survey, and the one-time National Survey of Residential Care Facilities.

*Coverage.* Initiated in 2012, the NSLTCP included providers that were licensed, registered, listed, certified, or otherwise regulated by the federal or state governments.

*Methodology.* Data on adult day services centers and residential care communities were obtained through surveys. Information on nursing homes, home health agencies, and hospices was obtained from CMS administrative records.

Survey data were collected through three modes: self-administered, hard copy mail questionnaires; self-administered web questionnaires; and computer-assisted telephone interviews (CATI). To the extent possible, the questionnaires included topics comparable across all five LTC sectors, as well as selected topics specific to a particular sector.

An adult day services center frame was obtained from the National Adult Day Services Association (NADSA) containing 5,349 self-identified adult day services centers; duplicates were removed from the frame, leaving 5,348 centers in the sampling frame for the 2016 wave. A census of all adult day services centers on the sampling frame were included in the 2016 NSLTCP. In addition to being included in the NADSA database, centers were eligible if they: 1) were licensed or certified by the state specifically to provide adult day services, or accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF); or authorized or otherwise set up to participate in Medicaid (Medicaid state plan, Medicaid waiver, or Medicaid managed care) or part of a Program of All-Inclusive Center for the Elderly (PACE); 2) had average daily attendance of at least one participant based on a typical week; and 3) had at least one participant enrolled at the center at the time of the survey.

The residential care community sampling frame was constructed from lists of licensed residential care communities obtained from the state licensing agencies in each of the 50 states and the District of Columbia. The state lists were checked for duplicate RCCs and concatenated, resulting in a sampling frame of 42,149 residential care communities for the 2016 wave. The residential care

community component included a mix of sampled communities from states that had enough residential care communities to produce reliable state estimates and a census of residential care communities in states that did not have enough communities to produce reliable state estimates. A sample of 11,688 residential care communities were selected for the 2016 wave. Among states where a sample was selected, the primary sampling strata were defined by state and community bed size. To be eligible for the survey, residential communities had to be state-licensed with four or more licensed beds; provide room and board of at least two meals a day, around-the-clock supervision, and offer assistance with personal care (like dressing) or health-related services (such as medication management); have at least one resident; and serve primarily an adult population. Residential care communities licensed to exclusively serve the mentally ill or intellectually disabled/developmentally disabled populations were excluded.

Every nursing home, home health agency, or hospice in the United States that was certified to provide services under Medicare, Medicaid, or both, and had user data, was included in the data. Facility data was obtained from the CMS' administrative records in Certification and Survey Provider Enhanced Reporting ([CASPER], formerly known as Online Survey Certification and Reporting); the third quarter file of the data year was used. User data were obtained from Minimum Data Set Active Resident Episode Table (MARET) for nursing home sector, Medicare Provider Analysis and Review (MedPAR) for nursing home sector, Outcome-Based Quality Improvement (OBQI) Case Mix Roll Up from the Outcome and Assessment Information Set (OASIS) for home health sector, and Institutional Provider and Beneficiary Summary (IPBS) for home health and hospice sectors.

*Sample Size and Response Rates.* Every certified nursing home, home health agency, and hospice with user information, and all users during the data time frame, was included. The 2015–2016 NSLTCP file included administrative data on 12,208 active home health agencies, 4,348 hospices, and 15,638 nursing homes. Of the 5,348 adult day services centers on the sampling frame, 4,586 were found to be in-scope or were presumed in-scope; 2,836 of them completed the questionnaire, for a response rate of 61.8%. From 42,149 residential communities in the sampling frame, 11,688 residential care communities were sampled; 5,485 communities could not be contacted by the end of data collection and 4,578 completed the questionnaire. This yielded a weighted response rate of 50.7%.

*Issues Affecting Interpretation.* The estimates for adult day services center participants, nursing home residents, and residential care community residents are for current service users on any given day, rather than all users in a year. The estimate for home health patients includes only those who ended care in the prior year (discharges). The same person may be included in this sum more than once, if a person received care in more than one sector in a similar time period (e.g., a residential care resident receiving care from a home health agency). While every effort was made to match question wording in the NSLTCP surveys to the administrative

data available through CMS, some differences remained and may affect comparisons between these two data sources. For example, because not all LTC providers are residential, information on capacity is not comparable across provider types. In addition, different data sources used different reference periods. For instance, user-level data used for home health agencies and hospices were from patients who received home health or hospice care services at any time in the calendar year prior to the survey. In contrast, survey data on residential care community residents and adult day services center participants, and CMS data on nursing home residents, were from current users on any given day or active residents on the last day of the third quarter of the data year.

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For more information, see the NSLTCP website at: <https://www.cdc.gov/nchs/nsltcp/index.htm>.

## National Survey on Drug Use and Health (NSDUH)

### Substance Abuse and Mental Health Services Administration (SAMHSA)

*Overview.* NSDUH reports on the prevalence, incidence, and patterns of illicit drug use and alcohol use among the U.S. civilian noninstitutionalized population aged 12 and over. NSDUH also reports on substance use disorders, substance use treatment, mental health problems, and mental health care.

*Coverage.* NSDUH is representative of persons aged 12 and over in the civilian noninstitutionalized population of the United States, and in each state and the District of Columbia (D.C.).

The survey covers residents of households (including those living in houses, townhouses, apartments, and condominiums), persons in noninstitutional group quarters

(including those in shelters, boarding houses, college dormitories, migratory work camps, and halfway houses), and civilians living on military bases. Persons excluded from the survey include people experiencing homelessness who do not use shelters, active military personnel, and residents of institutional group quarters such as jails, nursing homes, mental institutions, and long-term care hospitals.

*Methodology.* Data are collected via in-person interviews conducted with a sample of individuals at their place of residence. Computer-assisted interviewing methods, including audio computer-assisted self-interviewing, are used to provide a private and confidential setting to complete the interview.

NSDUH uses a 50-state (and D.C.) sample design that is revised periodically. In 2014, NSDUH introduced an independent multistage area probability sample within each state and D.C. States are the first level of stratification, and each state was then stratified into approximately equally populated state sampling regions (SSRs). Census tracts within each SSR were then selected, followed by census block groups within census tracts and area segments (i.e., a collection of census blocks) within census block groups. Finally, dwelling units (DUs) were selected within segments, and within each selected DU, up to two residents who were at least 12 years old were selected for the interview.

Also starting in 2014, changes were made in the sample sizes allocated to each state and to different age groups, in order to increase the precision of national estimates, many state estimates, and estimates for older adults. States with sample increases will have more precise estimates than in previous years, whereas states with smaller sample sizes will have some reductions in precision. However, all states will still have reasonable levels of precision. This allocation of sample to states is also thought to be more cost efficient. Starting in 2014, the sample size was redistributed by age group so that 25% of the sample is allocated to those aged 12–17, 25% to those aged 18–25, and 50% to those aged 26 and over. Although the sample sizes for age groups 12–17 and 18–25 were reduced, these two groups are still considered to be oversampled since they represent approximately 10% and 13% of the total population, respectively.

*Sample Size and Response Rate.* In 2017, screening was completed at 138,061 addresses, and 68,032 completed interviews were obtained, including 17,033 interviews from adolescents aged 12–17 and 50,999 interviews from adults aged 18 and over. Weighted response rates for household screening and for interviewing were 75.1% and 67.1%, respectively, for an overall response rate of 50.4% for people aged 12 and over.

*Issues Affecting Interpretation.* Several improvements to NSDUH were implemented in 2002. The data collected in 2002 represent a new baseline for tracking trends in substance use and other measures. Special questions on methamphetamine were added in 2005 and 2006. Data for years prior to 2007 were adjusted for comparability. Starting with 2011 data, 2010 Census-based control totals were used in the weighting process. Analysis weights in the 2002 through 2010 NSDUHs were derived from the 2000 Census

data. This reweighting to the 2010 Census data could affect comparisons between estimates for 2011 and subsequent years and those from prior years. However, an analysis of the impact of reweighting showed that the percentages of substance users were largely unaffected. For more information, see: <https://archive.samhsa.gov/data/NSDUH/NSDUHCensusEffects/Index.aspx>.

The NSDUH questionnaire underwent a partial redesign in 2015 to improve the quality of data and to address the changing needs of policymakers and researchers with regard to substance use and mental health issues. Due to the changes, only 2015, 2016, and 2017 data are presented for certain estimates until comparability with prior years can be established. Trends continue to be presented for estimates that are assumed to have remained comparable with those in earlier years. For more information, see: <https://www.samhsa.gov/data/sites/default/files/NSDUH-TrendBreak-2015.pdf>.

Estimates of substance use for youth based on NSDUH are not directly comparable with estimates based on the Monitoring the Future (MTF) Study and the Youth Risk Behavior Surveillance System (YRBSS). In addition to the fact that MTF excludes dropouts and absentees, rates are not directly comparable across these surveys because of differences in the populations covered, sample design, questionnaires, and interview setting. NSDUH collects data in residences, whereas MTF and YRBSS collect data in school classrooms. Furthermore, NSDUH estimates are tabulated by age, whereas MTF and YRBSS estimates are tabulated by grade, representing different ages as well as different populations.

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Substance Abuse and Mental Health Services Administration. Results from the 2017 National Survey on Drug Use and Health: Detailed tables. 2018. Available from: <https://www.samhsa.gov/data/sites/default/files/cbhsq-reports/NSDUHDetailedTabs2017/NSDUHDetailedTabs2017.pdf>

For more information, see the NSDUH website at: <https://www.samhsa.gov/data/data-we-collect/nsduh-national-survey-drug-use-and-health>, and the Center for Behavioral Health Statistics and Quality (the data collection agency) website at: <https://www.samhsa.gov/about-us/who-we-are/offices-centers/cbhsq>.

## National Vital Statistics System (NVSS)

### National Center for Health Statistics (NCHS)

*Overview.* NVSS collects and publishes official national statistics on births, deaths, fetal deaths, and, prior to 1996, marriages and divorces occurring in the United States, based on U.S. Standard Certificates. Fetal deaths are classified and tabulated separately from other deaths. The vital statistics files—Birth, Fetal Death, Mortality Multiple Cause-of-Death, Linked Birth/Infant Death, and Compressed Mortality—are described in detail below.

*Coverage.* NVSS collects and presents U.S. resident data for the aggregate of 50 states, New York City, and the District of Columbia (D.C.), as well as for each individual state, D.C., and the U.S.-dependent areas of Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas. Vital events occurring in the United States to non-U.S. residents and vital events occurring abroad to U.S. residents are excluded. Starting with *Health, United States, 2013*, information on vital events for Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas is shown in selected state tables but is not included in U.S. totals.

*Methodology.* NCHS' Division of Vital Statistics obtains information on births and deaths from the registration offices of each of the 50 states, New York City, D.C., Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas. Until 1972, microfilm copies of all death certificates and a 50% sample of birth certificates were received from all registration areas and processed by NCHS. In 1972, some states began sending their data to NCHS through the Cooperative Health Statistics System (CHSS). States that participated in the CHSS program processed 100% of their death and birth records and sent the entire data file to NCHS on computer tapes. Currently, data are sent to NCHS following procedures similar to those under CHSS. The number of participating states grew from 6 in 1972 to 46 in 1984. Starting in 1985, all 50 states and D.C. participated in the Vital Statistics Cooperative Program.

*U.S. Standard Certificates.* U.S. Standard Certificates of Live Birth and Death and Fetal Death Reports are revised periodically, allowing evaluation and addition, modification, and deletion of items. Beginning with 1989, revised Standard Certificates replaced the 1978 versions. The 1989 revision of the death certificate included items on educational attainment and Hispanic origin of decedents, as well as changes to improve the medical certification of cause of death. Standard Certificates recommended by NCHS are modified in each registration area to serve the area's needs. However, most certificates conform closely in content and arrangement to the Standard Certificate, and all certificates contain a minimum data set specified by NCHS. The 2003 revision of vital records went into effect in some states and territories beginning in 2003; full implementation in all states, D.C., and territories (other than American Samoa) will be achieved with 2018 data. The 2003 revision of the death certificate included changes in the determination of multiple

racess, education level, prenatal care, tobacco use, and maternal mortality.

## **Birth File**

*Overview.* Vital statistics natality data are a fundamental source of demographic, geographic, and medical and health information on all births occurring in the United States. This is one of the few sources of comparable health-related data for small geographic areas over an extended time period. The data are used to present the characteristics of babies and their mothers, track trends such as birth rates for teenagers, and compare natality trends with those in other countries.

The Birth file includes characteristics of the baby, such as sex, birthweight, and weeks of gestation; demographic information about the parents, such as age, race, Hispanic origin, parity, educational attainment, marital status, and state of residence; medical and health information, such as prenatal care, based on hospital records; and behavioral risk factors for the birth, such as mother's tobacco use during pregnancy.

*Coverage.* Birth data presented in *Health, United States* are based on reporting from all 50 states and D.C. Data for Alaska have been included starting in 1959, while data for Hawaii have been included starting in 1960 after each received statehood. Data for Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas are shown in selected state tables but are not included in U.S. totals. Beginning with 1970, births to nonresidents of the United States are excluded.

*Methodology.* In the United States, state laws require birth certificates to be completed for all births. The registration of births is the responsibility of the professional attendant at birth, generally a physician or midwife. The birth certificate must be filed with the local registrar of the district in which the birth occurs. Each birth must be reported promptly; the reporting requirements vary from state to state, ranging from 24 hours to as much as 10 days after the birth.

Federal law mandates national collection and publication of birth and other vital statistics data. NVSS is the result of cooperation between NCHS and the states to provide access to statistical information from birth certificates. Standard forms for the collection of the data, and model procedures for the uniform registration of the events, are developed and recommended for state use through cooperative activities of the states and NCHS. NCHS shares the costs incurred by the states in providing vital statistics data for national use.

*Issues Affecting Interpretation.* The 2003 revision of the birth certificate was phased in from 2003 to 2017. As of January 1, 2016, all states, territories (except American Samoa), and reporting areas had adopted the 2003 revision of the U.S. Standard Certificate of Live Birth. The 2003 certificate uses revised race and ethnicity sections conforming to the 1997 *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity*. However, to provide uniformity and comparability of data for trend

comparison, bridged race categories are still presented in *Health, United States*. Interpretation of trend data should take into consideration changes to reporting areas. For methodological and reporting area changes for the following birth certificate items, see [Appendix II](#), Age; Hispanic origin; Marital status; Race.

## **Reference**

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For more information, see the NVSS Birth Data website at: <https://www.cdc.gov/nchs/nvss/births.htm>, and Vitalstats at: [https://www.cdc.gov/nchs/data\\_access/Vitalstatsonline.htm](https://www.cdc.gov/nchs/data_access/Vitalstatsonline.htm).

## **Fetal Death Data Set**

*Overview.* Fetal mortality refers to the intrauterine death of a fetus at any gestational age. In *Health, United States*, data are presented for fetal deaths at 20 weeks or more. The Fetal Death data set includes characteristics of the fetus, such as sex, birthweight, and weeks of gestation; demographic information about the mother, such as age, race, Hispanic origin, and live-birth order; and medical and health information, such as maternal diabetes and hypertension.

*Coverage.* Data presented in *Health, United States* are based on reporting from all 50 states and D.C. Data for Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas are not included in U.S. totals but are included in the fetal death user's guides, available from the NCHS website at: [https://www.cdc.gov/nchs/data\\_access/VitalStatsOnline.htm](https://www.cdc.gov/nchs/data_access/VitalStatsOnline.htm), and in periodic reports.

*Methodology.* Fetal death means the death of a fetus prior to delivery from the mother, irrespective of the duration of pregnancy. Fetal deaths do not include induced terminations of pregnancy. This definition of fetal death, adopted by NCHS as the nationally recommended standard, is based on the definition published by the World Health Organization (WHO) in 1950 and revised in 1988. The term fetal death encompasses other commonly used terms, including stillbirth, spontaneous abortion, and miscarriage. All U.S. states and registration areas have definitions similar to the standard definition, except for Puerto Rico and Wisconsin, which have no formal definition.

State laws require the reporting of fetal deaths, and federal law mandates national collection and publication of fetal death data. States and reporting areas submit fetal mortality data to NCHS as part of a cooperative agreement. Standard forms and procedures for the collection of the data are developed and recommended for state use through cooperative activities of the states and NCHS. NCHS shares the costs incurred by the states in providing vital statistics data for national use.

In addition to fetal mortality rates, perinatal mortality rates are also presented in *Health, United States*. Perinatal mortality includes both late fetal deaths (of at least 28 weeks of gestation) and early infant (neonatal) deaths (within 7 days of birth). Data on early infant deaths come from the Linked Birth/Infant Death data set.

*Issues Affecting Interpretation.* Reporting requirements for fetal deaths vary by state, and these differences have important implications for comparisons of fetal mortality rates by state. The majority of states require reporting of fetal deaths at 20 weeks of gestation or more, or a minimum of 350 grams birthweight (roughly equivalent to 20 weeks), or some combination of the two. In 2017, six states required reporting of fetal deaths at all periods of gestation, two states required reporting beginning at 12 weeks of gestation, and one required reporting beginning at 16 weeks of gestation. Further, one state required the reporting of fetal deaths with birthweights of 500 grams or more (roughly equivalent to 22 weeks of gestation).

Starting with 2014 data, the obstetric estimate of gestation at delivery (OE) is used to determine gestational age, instead of the last normal menses (LMP), which was used for earlier years. The adoption of OE for gestational age had no or negligible impact on total fetal mortality rates. However, late fetal mortality rates based on the OE were lower than those based on the LMP. For more information, see User Guide to the 2017 Fetal Death Public Use File at: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/DVS/fetaldeath/2017FetalUserGuide.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/fetaldeath/2017FetalUserGuide.pdf).

There is substantial evidence that not all fetal deaths for which reporting is required are, in fact, reported. Underreporting of fetal deaths is most likely to occur in the earlier part of the required reporting period for each state. For example, in 2013, for those states requiring reporting of fetal deaths at all periods of gestation, 56.4% of fetal deaths at 20 weeks of gestation or more were at 20–27 weeks, whereas for states requiring reporting of fetal deaths of 500 grams or more, only 33.8% were at 20–27 weeks, thus indicating substantial underreporting of early fetal deaths in some states.

### References

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For more information, see the NCHS Fetal Deaths data website at: [https://www.cdc.gov/nchs/fetal\\_death.htm](https://www.cdc.gov/nchs/fetal_death.htm).

## Mortality Multiple Cause-of-Death File

*Overview.* Vital statistics mortality data are a fundamental source of demographic, geographic, and underlying and multiple cause-of-death information. Multiple cause-of-death data reflect all medical information reported on death certificates and complement traditional underlying cause-of-death data. Multiple-cause data give information on diseases that are a factor in death, whether or not they are the underlying cause of death; on associations among diseases; and on injuries leading to death.

The Mortality multiple cause-of-death file includes demographic information on age, sex, race, Hispanic origin, state of residence, and educational attainment, as well as medical information on causes of death. This data set is one of the few sources of comparable health-related data for small geographic areas over an extended time period. The data are used to present the characteristics of those dying in the United States, to determine life expectancy, and to compare mortality trends with those in other countries.

*Coverage.* Mortality data presented in *Health, United States* are based on reporting from all 50 states and D.C. Data for Alaska have been included starting in 1959, while data for Hawaii have been included starting in 1960 after each received statehood. Data for Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas are shown in selected state tables, but are not included in U.S. totals. Beginning with 1970, mortality statistics for the United States exclude deaths of U.S. nonresidents. Mortality statistics for Puerto Rico, Virgin Islands, American Samoa, and Northern Marianas excluded deaths of nonresidents for each area. For Guam, mortality statistics exclude deaths that occurred to a resident of any place other than Guam or the United States (50 states and D.C.).

*Methodology.* By law, the registration of deaths is the responsibility of the funeral director. The funeral director obtains demographic data for the death certificate from an informant. The physician in attendance at the death is required to certify the cause of death. Where cause of death is from other than natural causes, a coroner or medical examiner may be required to examine the body and certify the cause of death. For more information on the role of the medical examiner and coroner systems for data quality, see Miniño et al.

NCHS is responsible for compiling and publishing annual national statistics on causes of death. In carrying out this responsibility, NCHS adheres to WHO Nomenclature Regulations. These regulations require (a) that cause of death be coded in accordance with the applicable revision of the *International Classification of Diseases* (ICD) (see [Appendix II, International Classification of Diseases \[ICD\]; Table III](#)); and (b) that underlying cause of death be selected in accordance with international rules. Traditionally, national mortality statistics have been based on a count of deaths, with one underlying cause assigned for each death.

Prior to 1968, mortality medical data were based on manual coding of an underlying cause of death for each certificate in accordance with WHO rules. Starting with 1968,

NCHS converted to computerized coding of the underlying cause and manual coding of all causes (multiple causes) on the death certificate. In this system, called Automated Classification of Medical Entities (ACME), multiple-cause codes serve as inputs to the computer software, which employs WHO rules to select the underlying cause. ACME is used to select the underlying cause of death for all death certificates in the United States, and cause-of-death data in *Health, United States* are coded using ACME.

In addition, NCHS has developed two computer systems as inputs to ACME. Beginning with 1990 data, the Mortality Medical Indexing, Classification, and Retrieval system (MICAR) was introduced to automate coding of multiple causes of death. MICAR provides more detailed information on the conditions reported on death certificates than is available through the ICD code structure. Then, beginning with data year 1993, SuperMICAR, an enhancement of MICAR, was introduced. SuperMICAR allows for literal entry of the multiple cause-of-death text as reported by the certifier. This information is then processed automatically by the MICAR and ACME computer systems. Records that cannot be processed automatically by MICAR or SuperMICAR are multiple-cause-coded manually and then further processed through ACME. Starting in 2003, SuperMICAR was used to process all of the country's death records.

Data for the entire United States refer to events occurring within the 50 states and D.C.; data for geographic areas are by place of residence. For methodological and reporting area changes for the following death certificate items, see [Appendix II](#), Hispanic origin; Race.

*Issues Affecting Interpretation.* ICD, by which cause of death is coded and classified, is revised approximately every 10 to 20 years. Because revisions of ICD may cause discontinuities in trend data by cause of death, comparison of death rates by cause of death across ICD revisions should be done with caution and with reference to the comparability ratio (see [Appendix II](#), Comparability ratio). Prior to 1999, modifications to ICD were made only when a new revision of ICD was implemented. A process for updating ICD was introduced with the 10th revision (ICD–10) that allows for midrevision changes. These changes, however, may affect comparability of data between years for select causes of death. Minor changes may be implemented every year, whereas major changes may be implemented every 3 years (e.g., 2003 data year). In data year 2006, major changes were implemented, including the addition and deletion of several ICD codes. For more information, see Heron et al.

Multiple-cause data were obtained from all certificates for 1968–1971, 1973–1980, and 1983–present. Data were obtained from a 50% sample of certificates for 1972. Multiple-cause data for 1981 and 1982 were obtained from a 50% sample of certificates from 19 registration areas. For the other states, data were obtained from all certificates.

The death certificate has been revised periodically. A revised U.S. Standard Certificate of Death was recommended for state use beginning January 1, 1989. Among the changes were the addition of a new item on educational attainment and Hispanic origin of the decedent and changes to improve

the medical certification of cause of death. The U.S. Standard Certificate of Death was revised again in 2003; states are adopting this new certificate on a rolling basis.

The 2003 revision permits reporting of more than one race (multiple races). This change was implemented to reflect the increasing diversity of the U.S. population and to be consistent with the decennial census. Some states, however, are still using the 1989 revision of the U.S. Standard Certificate of Death, which allows only a single race to be reported. Until all states adopt the new death certificate, the race data reported using the 2003 revision are “bridged” for those for whom more than one race was reported (multiple race) to one single race, to provide comparability with race data reported on the 1989 revision. For more information on the impact of the 2003 certificate revisions on mortality data presented in *Health, United States*, see [Appendix II](#), Race.

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National Center for Health Statistics. Multiple causes of death in the United States. *Monthly Vital Stat Report*; vol 32 no 10 suppl 2. Hyattsville, MD: National Center for Health Statistics. 1984. Available from: [https://www.cdc.gov/nchs/data/mvsr/supp/mv32\\_10s2.pdf](https://www.cdc.gov/nchs/data/mvsr/supp/mv32_10s2.pdf).

For more information, see the NCHS Mortality Data website at: <https://www.cdc.gov/nchs/deaths.htm>.

### Linked Birth/Infant Death Data Set

*Overview.* National linked files of live births and infant deaths are used for research on infant mortality. The Linked Birth/Infant Death data set links information from the birth certificate to information from the death certificate for each infant death in the United States. The purpose of the linkage is to use the many additional variables from the birth certificate, including the more accurate race and ethnicity data, for more detailed analyses of infant mortality patterns. The Linked Birth/Infant Death data set includes all variables on the natality (Birth) file, including racial and ethnic information, birthweight, and maternal smoking, as well as variables on the Mortality file, including cause of death and age at death.

**Coverage.** To be included in the U.S.-linked file, both the birth and death must have occurred in the 50 states, D.C., Puerto Rico, Virgin Islands, or Guam. Data for Puerto Rico, Virgin Islands, and Guam are shown in selected state tables but are not included in U.S. totals. Linked birth/infant death data are not available for American Samoa and Northern Marianas.

**Methodology.** Infant deaths are defined as a death before the infant's first birthday. About 98%–99% of infant death records can be linked to their corresponding birth certificates. The linkage makes available extensive information from the birth certificate about the pregnancy, maternal risk factors, infant characteristics, and health items at birth that can be used for more detailed analyses of infant mortality. The linked file is used for calculating infant mortality rates by race and ethnicity, which are more accurately measured from the birth certificate.

Starting with 1995 data, linked birth/infant death data files are available in two different formats: period data and birth cohort data. The numerator for the period linked file consists of all infant deaths occurring in a given data year linked to their corresponding birth certificates, whether the birth occurred in that year or the previous year. The numerator for the birth cohort linked file consists of deaths to infants born in a given year. In both cases, the denominator is all births occurring in the year. For example, the 2013 period linked file contains a numerator file that consists of all infant deaths occurring in 2013 that have been linked to their corresponding birth certificates, whether the birth occurred in 2012 or 2013. In contrast, the 2013 birth cohort linked file will contain a numerator file that consists of all infant deaths to babies born in 2013, whether the death occurred in 2013 or 2014. Although the birth cohort format has methodological advantages, it creates substantial delays in data availability because it is necessary to wait until the close of the following data year to include all infant deaths in the birth cohort. Starting with 1995 data, period linked files are used for infant mortality rate tables in *Health, United States*.

Other changes to the data set starting with 1995 include the addition of record weights to compensate for the 1%–2% of infant death records that could not be linked to their corresponding birth records. In addition, not-stated birthweight was imputed if the period of gestation was known. This imputation was done to improve the accuracy of birthweight-specific infant mortality rates because the percentage of records with not-stated birthweight is generally higher for infant deaths (4.09% in 2017) than for live births (0.07% in 2017). In 2017, not-stated birthweight was imputed for 0.06% of births.

**Issues Affecting Interpretation.** Period linked file data starting with 1995 are not strictly comparable with birth cohort data for 1983–1991. A new revision of the birth certificate was introduced in 2003, and as of 2016 data, all states and reporting areas (except for American Samoa) had adopted the 2003 version of the birth certificate.

## References

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For more information, see the NCHS Linked Birth and Infant Death Data website at: <https://www.cdc.gov/nchs/linked.htm>.

## National Youth Tobacco Survey (NYTS)

### Centers for Disease Control and Prevention (CDC), Office on Smoking and Health (OSH) and U.S. Food and Drug Administration (FDA), Center for Tobacco Products (CTP)

**Overview.** NYTS is an annual school-based survey of U.S. middle and high school students that collects data on tobacco use and tobacco-related attitudes, beliefs, and influences. Data collected include use of cigarettes, cigars, smokeless tobacco, e-cigarettes, hookahs, pipe tobacco, and bidis within the past 30 days.

**Coverage.** Data are nationally representative of 6th through 12th graders in public and private middle and high schools in the United States.

**Methodology.** Prior to 2011, the survey was administered on an approximately biennial basis. From 2011–2018, the survey has been conducted annually. The survey uses a three-stage cluster sampling design to generate a nationally representative sample of U.S. students attending public and private schools in grades 6 through 12. Data are collected using a voluntary, school-based, self-administered, pencil-and-paper questionnaire. Make-up surveys are pursued for eligible students who are absent on the scheduled date of data collection. Ineligible students, including those who had moved and were no longer attending the school, dropouts, those with extended absences, and students who could not complete the survey independently, were excluded from survey participation. Data were weighted to account for the complex survey design and adjusted for nonresponse.

**Sample Size and Response Rate.** In 2018, a total of 20,189 students from 238 public and private schools in the United States participated, with an overall response rate of 68%. The 20,189 participants were broken down by grade as follows: 2,568 12th graders, 2,824 11th graders, 2,664 10th graders, 2,935 9th graders, 3,012 8th graders, 3,140 7th graders, and 2,903 6th graders (143 students were missing data on self-reported grade level). During 2011–2018, sample

sizes ranged from a low of 17,711 (in 2015) to a high of 24,658 (in 2012), and response rates ranged from a low of 63% (2015) to a high of 74% (2012).

*Issues Affecting Interpretation.* Estimates of substance use among youth based on NYTS are not directly comparable with estimates based on the National Survey on Drug Use and Health (NSDUH), the Monitoring the Future (MTF) Study, and the Youth Risk Behavior Surveillance System (YRBSS). This is because of differences in populations covered, sample design, questionnaires, interview settings, and data cleaning procedures. NSDUH collects data in residences, whereas NYTS, MTF, and YRBSS collect data in school classrooms. In addition, NSDUH estimates are tabulated by age, whereas NYTS, MTF, and YRBSS estimates are tabulated by school level or grade, representing different ages as well as different populations.

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For more information, see the NYTS website at: [https://www.cdc.gov/tobacco/data\\_statistics/surveys/nyts/index.htm](https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm).

## Population Census and Population Estimates

### U.S. Census Bureau

#### *Decennial Census*

The census of population (decennial census) has been held in the United States every 10 years since 1790. Since 1930, it has enumerated the resident population as of April 1 of the census year. Data on sex, race, Hispanic origin, age, and marital status are collected from 100% of the enumerated population.

#### *Race Data on the 1990 Census*

The question on race on the 1990 Census was based on the Office of Management and Budget's (OMB) 1977 *Race and Ethnic Standards for Federal Statistics and Administrative Reporting* (Statistical Policy Directive 15). This document specified rules for the collection, tabulation, and reporting of racial and ethnic data within the federal statistical system. The 1977 Standards required federal agencies to report

race-specific tabulations using four single-race categories: American Indian or Alaska Native, Asian or Pacific Islander, black, and white. Under the 1977 Standards, race and ethnicity were considered to be two separate and distinct concepts. Thus, persons of Hispanic origin may be of any race.

#### *Race Data on the 2000 Census*

The question on race on the 2000 Census was based on OMB's 1997 *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity* (see: Federal Register 62(210):58782–90. 1997.). (Also see [Appendix II](#), Race.) The 1997 Standards incorporated two major changes in the collection, tabulation, and presentation of race data. First, the 1997 Standards increased the minimum set of categories to be used by federal agencies for identification of race from four to five: American Indian or Alaska Native, Asian, black or African American, Native Hawaiian or Other Pacific Islander, and white. Second, the 1997 Standards included the requirement that federal data collection programs allow respondents to select one or more race categories when responding to a query on their racial identity. This provision means that there are potentially 31 race groups, depending on whether an individual selects one, two, three, four, or all five of the race categories. The 1997 Standards continue to call for use, when possible, of a separate question on Hispanic or Latino ethnicity and specify that the ethnicity question should appear before the question on race. Thus, under the 1997 Standards, as under the 1977 Standards, persons of Hispanic origin may be of any race.

#### *Race Data on the 2010 Census*

Similar to race data on the 2000 Census, the question on race on the 2010 Census was based on OMB's 1997 *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity* (see: Federal Register 62(210):58782–90. 1997.). (Also see [Appendix II](#), Race.) The 1997 Standards required a minimum set of categories to be used by federal agencies for identification of race: American Indian or Alaska Native, Asian, black or African American, Native Hawaiian or Other Pacific Islander, and white, and require that federal data collection programs allow respondents to select one or more race categories when responding to a query on their racial identity. The 1997 Standards continue to call for use, when possible, of a separate question on Hispanic or Latino ethnicity and specify that the ethnicity question should appear before the question on race. Thus, under the 1997 Standards, as under the 1977 Standards, persons of Hispanic origin may be of any race.

#### *Modified Decennial Census Files*

For several decades, the U.S. Census Bureau has produced Modified Decennial Census files. These modified files incorporate adjustments to the 100% April 1 count data for (a) errors in the census data discovered subsequent to

publication, (b) misreported age data, and (c) nonspecified race.

For the 1990 Census, the U.S. Census Bureau modified the age, race, and sex data on the census and produced the Modified Age-Race-Sex (MARS) file. The differences between the population counts in the original census file and the MARS file are primarily due to modification of the race data. Of the 248.7 million persons enumerated in 1990, 9.8 million did not specify their race (more than 95% were of Hispanic origin). For the 1990 MARS file, these persons were assigned the race reported by a nearby person with an identical response to the Hispanic-origin question.

For the 2000 and 2010 Censuses, the U.S. Census Bureau modified the race data and produced the Modified Race Data Summary files. For these files, persons who did not report a race (reported only the category “Some other race”) as part of their race response were assigned by imputation to one of the 31 race groups, which are the single- and multiple-race combinations of the five race categories specified in the 1997 OMB race and ethnicity standards. For the 2000 Census, 97% of the 15.4 million persons who did not report a race were of Hispanic origin. Because a large proportion of those identifying their race as “Some other race” are Hispanic, for the 2010 Census, a new instruction was added that, for the census, Hispanic origins are not races. For the 2010 Census, 97% of the 19.1 million persons who did not report a race (reported only the category “Some other race”) were of Hispanic origin.

### ***Postcensal Population Estimates***

Postcensal population estimates are estimates made for the years following a census, before the next census is taken. Postcensal population estimates are derived annually by updating the resident population enumerated in the decennial census using a components-of-population-change approach. Each annual series includes estimates for the current data year and revised estimates for the earlier years in the decade. The following formula is used to derive national estimates for a given year from those for the previous year, starting with the decennial census enumerated resident population as the base:

Resident population estimate  
+ births to U.S. resident women  
– deaths to U.S. residents  
+ net international migration

The postcensal estimates are consistent with official decennial census figures and do not reflect estimated decennial census under-enumeration.

Estimates for the earlier years in a given series are revised to reflect changes in the components-of-change data sets (for example, births to U.S. resident women from a preliminary natality file are replaced with counts from a final natality file). To help users keep track of which postcensal estimate is being used, each annual series is referred to as “vintage,” and the last year in the series is used to name the

series. For example, both the vintage 2011 and the vintage 2012 postcensal series have revised estimates for July 1, 2011, but the estimates for July 1, 2011, from the vintage 2011 and vintage 2012 postcensal series differ.

The U.S. Census Bureau also produces postcensal estimates of the resident population of states and counties, using the components-of-population-change method. An additional component of population change—net internal migration—is involved.

### ***Intercensal Population Estimates***

Intercensal population estimates are estimates made for the years between two decennial censuses and are produced once the census at the end of the decade has been completed. They replace the postcensal estimates produced prior to the completion of the census at the end of the decade. Intercensal estimates are more accurate than postcensal estimates because they are based on both the census at the beginning and the census at the end of the decade. They are derived by adjusting the final postcensal estimates for the decade to correct for the error of closure (the difference between the estimated population at the end of the decade and the census count for that date). The patterns of population change observed over the decade are preserved. The intercensal estimates for the 1990s were produced using the same methodology used to generate the intercensal estimates for the 1980s. The revised intercensal population estimates for 2000–2009 were produced using a modified version of the methodology used previously. Vital rates calculated using postcensal population estimates are routinely revised when intercensal estimates become available.

### ***Bridged-race Population Estimates***

During the transition to full implementation of the 1997 OMB standards on race and ethnicity, race data on the 2000 and 2010 Censuses were not comparable with race data on other data systems that were continuing to collect data using the 1977 OMB Standards on race and ethnicity. For example, states implemented the revised birth and death certificates—which have race and ethnicity items that are compliant with the 1997 OMB Standards—at different times and some states still used the 1989 death certificates that collect race and ethnicity data in accordance with the 1977 OMB Standards. Thus, population estimates for 1990 and beyond with race categories comparable with the 1977 OMB categories were needed so that race-specific birth and death rates can be calculated. To meet this need, the National Center for Health Statistics (NCHS), in collaboration with the U.S. Census Bureau, developed methodology to bridge the 31 race groups in Census 2000 and Census 2010 to the four single-race categories specified under the 1977 OMB Standards. As of January 1, 2016, all states and D.C., in addition to Puerto Rico, the U.S. Virgin Islands, Guam, and Northern Marianas, use the 2003 revision of the U.S. Standard Certificate of Live Birth and report race according

to the 1997 revised OMB standards. However, to provide uniformity and comparability of data for trend comparison, bridged single-race categories are still presented in *Health, United States*.

The bridging methodology was developed using information from the 1997–2000 National Health Interview Survey (NHIS). NHIS provides a unique opportunity to investigate multiple-race groups because, since 1982, it has allowed respondents to choose more than one race but has also asked respondents reporting multiple races to choose a primary race. The bridging methodology developed by NCHS involved the application of regression models relating person-level and county-level covariates to the selection of a particular primary race by the multiple-race respondents. The bridging proportions derived from these models have been applied by the U.S. Census Bureau to various unbridged resident population files. These applications have resulted in bridged-race population estimates for each of the four single-race categories: American Indian or Alaska Native, Asian or Pacific Islander, black, and white.

In *Health, United States*, vital rates for 1991–1999 were calculated using the July 1, 1991–July 1, 1999 bridged-race intercensal estimates. Vital rates for 2000 were calculated using the bridged-race April 1, 2000, census counts, and those for 2010 were calculated using the bridged-race April 1, 2010, census counts. Starting with *Health, United States*, 2012, vital rates for 2001–2009 have been recalculated using the July 1, 2001–July 1, 2009, revised intercensal bridged-race population estimates. Vital rates for 2011 and beyond are calculated using bridged-race estimates of the July 1 population from the corresponding postcensal vintage.

### Reference

Ingram DD, Parker JD, Schenker N, Weed JA, Hamilton B, Arias E, Madans JH. United States Census 2000 population with bridged race categories. National Center for Health Statistics. Vital Health Stat 2(135). 2003. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_135.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_135.pdf).

For more information, see the U.S. Census Bureau website at: <https://www.census.gov>, and the NCHS website for U.S. census populations with bridged-race categories at: [https://www.cdc.gov/nchs/nvss/bridged\\_race.htm](https://www.cdc.gov/nchs/nvss/bridged_race.htm).

## Sexually Transmitted Disease (STD) Surveillance

### Centers for Disease Control and Prevention (CDC), National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP)

*Overview.* Surveillance information on the incidence and prevalence of STDs is used to inform public and private health efforts to control these diseases. Case reporting data are available for nationally notifiable diseases, including chancroid, chlamydia, gonorrhea, and syphilis. Enhanced

surveillance of these conditions and surveillance of other STDs or STD sequelae, such as genital herpes simplex virus, genital warts, and trichomoniasis use data collected from other sources, including data from sentinel surveillance and national surveys.

*Coverage.* Case reports of STDs are reported to CDC by STD surveillance information systems operated by state and local STD control programs and health departments in 50 states, the District of Columbia, selected cities, all U.S. counties, and outlying areas consisting of U.S. dependencies, possessions, and independent countries in free association with the United States. Data from outlying areas are not included in *Health, United States*.

*Methodology.* Information is obtained from the following data sources: (a) case reporting of nationally notifiable STDs from state and local STD programs through the National Notifiable Disease Surveillance System (NNDSS); (b) projects that monitor STD positivity and prevalence in various settings, including the National Job Training Program, the STD Surveillance Network (SSuN), and the Gonococcal Isolate Surveillance Project (GISP); and (c) national sample surveys implemented by federal and private organizations.

*Issues Affecting Interpretation.* Most STDs are asymptomatic. Because of incomplete diagnosis and reporting, the number of STD cases reported to CDC undercounts the actual number of infections occurring among the U.S. population.

### Reference

Centers for Disease Control and Prevention. Sexually transmitted disease surveillance 2017. 2018. Available from: <https://www.cdc.gov/std/stats17/toc.htm>.

For more information, see the CDC website on STD data and statistics at: <https://www.cdc.gov/std/stats>, and the CDC website on STD diseases and related conditions: <https://www.cdc.gov/std/general/default.htm>.

## Private and Global Sources

### American Dental Association (ADA)

The ADA Masterfile contains the most up-to-date information on dentists in the United States. The Masterfile is a database of all dentists, both practicing and nonpracticing, in the United States. It is updated through a variety of methods, including reconciliation with state licensure databases, death records, and various surveys and censuses of dentists carried out by ADA.

ADA's Health Policy Institute conducts annual surveys of predoctoral dental educational institutions. A questionnaire, mailed to all dental schools, collects information on academic programs, admissions, enrollment, attrition, graduates, educational expenses and financial assistance, patient care, advanced dental education, and faculty positions.

## **References**

American Dental Association, Health Policy Institute. Tables 1 and 3. In: Supply of dentists in the U.S.: 2001–2017. Available from: <https://www.ada.org/en/science-research/health-policy-institute/data-center/supply-and-profile-of-dentists>.

American Dental Association, Health Policy Institute. Survey of Dental Education series. Report 1: Academic programs, enrollment and graduates. 2015–2016 report 1. 2016. Available from: [https://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/2015-16\\_SDE1\\_final.xlsx?la=en](https://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/2015-16_SDE1_final.xlsx?la=en).

For more information, see the ADA website at: <https://www.ada.org>.

## **American Hospital Association (AHA) Annual Survey of Hospitals**

Data from AHA's annual survey are based on questionnaires sent to all AHA-registered and nonregistered hospitals in the United States and its associated areas: American Samoa, Guam, the Marshall Islands, Puerto Rico, and the Virgin Islands. U.S. government hospitals located outside the United States are excluded. Overall, the average response rate over the past 5 years has been approximately 83%. For nonreporting hospitals and for the survey questionnaires of reporting hospitals on which some information was missing, estimates are made for all data except those on beds, bassinets, facilities, and services. Data for beds and bassinets of nonreporting hospitals are based on the most recent information available from those hospitals. Data for facilities and services are based only on reporting hospitals. Estimates of other types of missing data are based on data reported the previous year, if available. When unavailable, estimates are based on data furnished by reporting hospitals similar in size, control, major service provided, length of stay, and geographic and demographic characteristics.

### **Reference**

American Hospital Association. AHA hospital statistics, 2018 edition. Chicago, IL: AHA. 2018.

For more information, see the AHA website at: <https://www.aha.org>.

# Appendix II. Definitions and Methods

This appendix contains an alphabetical listing of terms used in *Health, United States*, and these definitions are specific to the data presented in this report. The methods used for calculating age-adjusted rates, average annual rates of change, relative standard errors, birth rates, death rates, and years of potential life lost are described. Included are standard populations used for age adjustment (Tables I and II), the years when the revisions for *International Classification of Diseases* (ICD) codes were in effect (Table III), codes for cause of death from the 6th through 10th revisions of ICD (Table IV), comparability ratios between the 9th and 10th revisions (ICD-9 and ICD-10) for selected causes (Table V), a comparison of high blood pressure based on two standards for high blood pressure (Table VI), imputed family income percentages from the National Health Interview Survey (NHIS) (Table VII), and an analysis of the effect of added probe questions for Medicare and Medicaid coverage on health insurance rates in NHIS (Table VIII). Standards for presenting federal data on race and ethnicity are described, and sample tabulations of NHIS data comparing the 1977 and 1997 Office of Management and Budget standards for the classification of federal data on race and ethnicity are presented in Tables IX and X.

**Acquired immunodeficiency syndrome (AIDS)**—Human immunodeficiency virus (HIV) is the pathogen that causes AIDS, and HIV disease is the term that encompasses all of the condition’s stages—from infection to the deterioration of the immune system and the onset of opportunistic diseases. However, AIDS is still a term commonly used to refer to the immune deficiency caused by HIV. If a person with HIV is diagnosed with at least one of a set of opportunistic illnesses or has laboratory values indicating advanced disease, he or she may be diagnosed as having AIDS. All 50 states, the District of Columbia, and 6 U.S.-dependent areas (American Samoa, Guam, Northern Mariana Islands, Puerto Rico, Republic of Palau, and U.S. Virgin Islands) report confirmed diagnoses of HIV infection and AIDS cases to the Centers for Disease Control and Prevention using a uniform surveillance case definition and case report form. The case reporting definitions have changed over time to incorporate a broader range of AIDS-indicator diseases and conditions and use HIV diagnostic tests to improve the sensitivity and specificity of the definition. Because of these case-definition changes, AIDS estimates over time may not be comparable. (Also see [Appendix II](#), Human immunodeficiency virus [HIV] disease.)

**Age**—Reported as age at last birthday (i.e., age in completed years), often calculated by subtracting an individual’s date of birth from the reference date, with the reference date being the date of the examination, interview, or other contact.

Mother’s (maternal) age is reported on the birth certificate by all states. Birth statistics are presented for

mothers aged 10–49 through 1996 and aged 10–54 starting in 1997, based on mother’s date of birth or age as reported on the birth certificate. The age of the mother is edited for upper and lower limits. When the age of the mother is computed to be under 10 or 55 and over (50 and over in 1964–1996), it is considered not stated and is imputed according to the age of the mother from the previous birth record of the same race and total birth order (total of fetal deaths and live births). Before 1963, not-stated ages were distributed in proportion to the known ages for each racial group.

Beginning in 1997, the birth rate for the maternal age group 45–49 has included data for mothers aged 50–54 in the numerator and has been based on the population of women aged 45–49 in the denominator. Beginning with 2003 data, age of mother is imputed for stated ages 8 and under and 65 and over, for births reported using the 2003 revision of the birth certificate. Starting with 2007 data, age of mother is imputed for all births for stated ages 8 and under and 65 and over, regardless of the birth certificate version used. As with data for earlier years, age is imputed according to the age of mother from the previous record with the same race and total birth order.

**Age adjustment**—Used to compare risks for two or more populations at one point in time or for one population at two or more points in time. Age-adjusted rates are computed using the direct method by applying age-specific rates in a population of interest to a standardized age distribution, to eliminate differences in observed rates that result from age differences in population composition. Age-adjusted rates should be viewed as relative indexes rather than actual measures of risk.

Age-adjusted rates are calculated by the direct method, as follows:

$$\sum_{i=1}^n r_i \times (p_i / P)$$

where

$r_i$  = rate in age group  $i$  in the population of interest

$p_i$  = standard population in age group  $i$

$$P = \sum_{i=1}^n p_i$$

$n$  = total number of age groups over the age range of the age-adjusted rate.

Age adjustment by the direct method requires the use of a standard age distribution. The standard for age-adjusting death rates and estimates from surveys in *Health, United States* is the projected year 2000 U.S. resident population. Starting with *Health, United States, 2000*, the projected year 2000 U.S. standard population replaced the 1970 civilian noninstitutionalized population

for age-adjusting estimates from most National Center for Health Statistics (NCHS) surveys; and starting with *Health, United States, 2001*, it was used uniformly and replaced the 1940 U.S. population for age-adjusting mortality statistics and the 1980 U.S. resident population, which previously had been used for age-adjusting estimates from the National Health and Nutrition Examination Survey.

Changing the standard population has implications for racial and ethnic differentials in mortality. For example, the mortality ratio for the black to white populations is reduced from 1.6 using the 1940 standard to 1.4 using the 2000 standard, reflecting the greater weight the 2000 standard gives to the older population, in which race differentials in mortality are smaller.

Age-adjusted estimates from any data source presented in *Health, United States* that use the projected year 2000 U.S. resident population may differ from age-adjusted estimates based on the same data presented in other reports if different age groups are used in the adjustment procedure.

For more information on implementing the 2000 population standard for age-adjusting death rates, see: Anderson RN, Rosenberg HM. Age standardization of death rates: Implementation of the year 2000 standard. National Vital Statistics Reports; vol 47 no 3. Hyattsville, MD: National

Center for Health Statistics. 1998. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr47/nvs47\\_03.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr47/nvs47_03.pdf). For more information on the derivation of age-adjustment weights for use with NCHS survey data, see: Klein RJ, Schoenborn CA. Age adjustment using the 2000 projected U.S. population. Healthy People 2010 statistical notes, no 20. Hyattsville, MD: National Center for Health Statistics. 2001. Available from: <https://www.cdc.gov/nchs/data/statnt/statnt20.pdf>. The projected year 2000 U.S. standard population is available from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program: <https://seer.cancer.gov/stdpopulations/stdpop.singleages.html>.

**Mortality data**—Death rates are age adjusted to the projected year 2000 U.S. standard population (Table I). Prior to 2001 data, age-adjusted rates were calculated using standard million proportions based on rounded population numbers (Table II). Starting with 2001 data, unrounded population numbers are used to adjust age. Adjustment is based on 11 age groups, with two exceptions. First, age-adjusted death rates for black males and black females in 1950 are based on nine age groups, with under 1 and 1–4 combined as one group, and 75–84 and 85 and over combined as one group.

**Table I. United States projected year 2000 standard population and age groups used to age-adjust data**

Data system and age (years)	Population
DVS mortality data	
Total	274,633,642
Under 75	258,059,676
Under 1	3,794,901
1–4	15,191,619
5–14	39,976,619
15–24	38,076,743
25–34	37,233,437
35–44	44,659,185
45–54	37,030,152
55–64	23,961,506
65–74	18,135,514
75–84	12,314,793
85 and over	4,259,173
NHIS	
All ages	274,633,642
18 and over	203,852,188
25 and over	177,593,760
40 and over	118,180,367
65 and over	34,709,480
Under 18	70,781,454
2–17	63,227,991
18–44	108,151,050
18–24	26,258,428
25–34	37,233,437
35–44	44,659,185
45–64	60,991,658
45–54	37,030,152
55–64	23,961,506
65–74	18,135,514
75 and over	16,573,966

**Table I. United States projected year 2000 standard population and age groups used to age-adjust data—Con.**

Data system and age (years)	Population
NHIS—Con.	
18–49	127,956,843
40–64	
40–49	42,285,022
50–64	41,185,865
NHANES	
20 and over	83,470,887
20–34	55,490,662
35–44	44,659,185
45–54	37,030,152
55–64	23,961,506
65 and over	34,709,480
20–44	100,149,847
45–64	60,991,658
65 and over	34,709,480
20–44	100,149,847
45–64	60,991,658
65–74	18,135,514
75 and over	16,573,966
Under 18	70,781,454
18–44	108,151,050
45–64	60,991,658
65 and over	34,709,480

NOTES: DVS is Division of Vital Statistics. NHIS is National Health Interview Survey. NHANES is National Health and Nutrition Examination Survey.

SOURCE: National Institutes of Health, National Cancer Institute, Surveillance, Epidemiology, and End Results (SEER). Standard populations—single ages. Available from: <https://seer.cancer.gov/stdpopulations/>.

**Table II. United States projected year 2000 standard population and proportion distribution by age, for age-adjusting death rates prior to 2001**

Age (years)	Population	Proportion distribution (weight)	Standard million
Total	274,634,000	1.000000	1,000,000
Under 1	3,795,000	0.013818	13,818
1–4	15,192,000	0.055317	55,317
5–14	39,977,000	0.145565	145,565
15–24	38,077,000	0.138646	138,646
25–34	37,233,000	0.135573	135,573
35–44	44,659,000	0.162613	162,613
45–54	37,030,000	0.134834	134,834
55–64	23,961,000	0.087247	87,247
65–74	18,136,000	0.066037	66,037
75–84	12,315,000	†0.044842	44,842
85 and over	4,259,000	0.015508	15,508

† Figure is rounded up instead of down to force total to 1.0.

SOURCE: National Center for Health Statistics. Anderson RN, Rosenberg HM. Age standardization of death rates: Implementation of the year 2000 standard. National Vital Statistics Reports; vol 47 no 3. Hyattsville, MD: National Center for Health Statistics. 1998. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr47/nvs47\\_03.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr47/nvs47_03.pdf).

Second, age-adjusted rates for years of potential life lost before age 75 also use the projected year 2000 standard population and are based on eight age groups: under 1, 1–14, 15–24, and 10-year age groups through 65–74.

*National Health and Nutrition Examination Survey (NHANES)*—Estimates based on the National Health Examination Survey and NHANES are generally age adjusted to the projected year 2000 U.S. standard population using five age groups: 20–34, 35–44, 45–54, 55–64, and 65–74 or 65 and over (Table I). Prior to *Health, United States, 2001*, these estimates were age adjusted to the 1980 U.S. resident population.

*National Health Interview Survey (NHIS)*—Estimates based on NHIS are age adjusted to the projected year 2000 U.S. standard population (Table I). Prior to *Health, United States, 2000*, NHIS estimates were age adjusted to the 1970 civilian noninstitutionalized population. Information on the age groups used in the age-adjustment procedure is contained in the footnotes of the specific tables.

**AIDS**—See Appendix II, Acquired immunodeficiency syndrome (AIDS).

**Alcohol consumption**—Measured differently in various data systems. (Also see Appendix II, Binge drinking.)

*National Survey on Drug Use and Health (NSDUH)*—Asks respondents aged 12 and over about their alcohol use in the 30 days before the interview. Current alcohol use is defined as any use of alcohol in the past 30 days. In addition to asking about any alcohol use, NSDUH collects information on binge alcohol use and heavy alcohol use, which are not mutually exclusive categories.

**Average annual rate of change (percent change)**—In *Health, United States*, average annual rates of change, or growth rates, are calculated as follows:

$$[(P_n / P_o)^{1/N} - 1] \times 100$$

where

$P_n$  = later time period

$P_o$  = earlier time period

$N$  = number of years in interval

This geometric rate of change assumes that a variable increases or decreases at the same rate during each year between the two time periods.

**Bed, health facility**—The American Hospital Association (AHA) defines bed count as the number of beds, cribs, and pediatric bassinets that are set up and staffed for use by inpatients on the last day of the reporting period. (Also see Appendix II, Hospital; Occupancy rate.)

**Binge drinking and heavy alcohol use**—Measured in the various data systems. (Also see Appendix II, Alcohol consumption.)

*National Survey on Drug Use and Health (NSDUH)*—Asks respondents aged 12 and over about their alcohol use in the 30 days before the interview. Until 2015, the threshold for binge alcohol use was defined the same for males and females: drinking five or more drinks on the same occasion on at least 1 day in the past 30 days. Since 2015, the definition remains the same for males, while binge alcohol use for females has been lowered to drinking four or more drinks on the same occasion on at least 1 day in the past 30 days. Due to this definition change, recent data on binge alcohol use among women cannot be compared with estimates prior to 2015.

Heavy alcohol use is defined as binge drinking on 5 or more days in the past 30 days. Because heavy alcohol users are binge alcohol users by definition, estimates of heavy alcohol use among females also were affected by the 2015 question revision, and recent estimates are not comparable with data collected prior to 2015.

**Birth cohort**—Consists of all persons born within a given period of time, such as a calendar year.

**Birth rate**—See [Appendix II](#), Rate: Birth and related rates.

**Birthweight**—The first weight of the newborn obtained after birth. Low birthweight is defined as weighing less than 2,500 grams (5 lb 8 oz). Very low birthweight is defined as weighing less than 1,500 grams (3 lb 4 oz). Prior to 1979, low birthweight was defined as weighing 2,500 grams or less, and very low birthweight as weighing 1,500 grams or less.

**Blood pressure, high**—See [Appendix II](#), Hypertension.

**Body mass index (BMI)**—Body Mass Index (BMI) is a measure of body fat based on height and weight. It is calculated as a person's weight in kilograms divided by the square of height in meters. BMI can be used to define weight categories, which may be associated with disease risk. Normal weight for adults is defined as BMI of 18.5 to 24.9; overweight but not obese is defined as BMI of 25.0 to 29.9; and obesity is BMI greater than or equal to 30.0. Within the obesity category, Grade 1 obesity is defined as BMI of 30.0 to 34.9; Grade 2 is BMI of 35.0 to 39.9; and Grade 3 is BMI of greater than or equal to 40.0.

Prior to assigning a person to a BMI category, BMI is rounded to one decimal place. In *Health, United States*, the National Health and Nutrition Examination Survey variable Body Mass Index is used to assign persons to BMI categories. Pregnant females were excluded from both adult and child analyses. Mobile examination center (MEC) weights were used to obtain estimates of BMI for both adults and children. However, in NHANES III, almost 500 adults had an abbreviated examination in their home instead of going to the MEC. The MEC + home weight was used to include these persons in the estimates.

For more information on the BMI cut points for adults, see: National Heart, Lung, and Blood Institute. Managing overweight and obesity in adults: Systematic evidence review from the Obesity Expert Panel. 2013. Available from: <https://www.nhlbi.nih.gov/health-pro/guidelines/in-develop/obesity-evidence-review>; Jensen MD, Ryan DH, Apovian CM, Ard JD, Comuzzie AG, Donato KA, et al. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Obesity Society. *Circulation* 129(25 Suppl 2):S102–38. 2014. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5819889/>; U.S. Department of Health and Human Services. Healthy People 2020: Nutrition, physical activity, and obesity. 2012. Available from: <https://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Nutrition-Physical-Activity-and-Obesity>.

Obesity for children and adolescents is defined as BMI at or above the sex- and age-specific 95th percentile from the 2000 Centers for Disease Control and Prevention Growth Charts (<https://www.cdc.gov/growthcharts/>). The age used is age in months at the time of examination. Also see: Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn

LM, Flegal KM, Mei Z, et al. 2000 CDC Growth Charts for the United States: Methods and development. *National Center for Health Statistics. Vital Health Stat* 11(246). 2002. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_246.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_246.pdf).

Starting with *Health, United States, 2010*, the terminology describing excess weight among children changed from previous editions. The term “obesity” now refers to children who were formerly labeled as overweight. This is a change in terminology only and not a change in measurement. For more information, see: Ogden CL, Flegal KM. Changes in terminology for childhood overweight and obesity. *National Health Statistics Reports*; no 25. Hyattsville, MD: National Center for Health Statistics. 2010. Available from: <https://www.cdc.gov/nchs/data/nhsr/nhsr025.pdf>.

**Cause of death**—For the purpose of national mortality statistics, every death is attributed to one underlying condition, based on information reported on the death certificate and using the international rules for selecting the underlying cause of death from the conditions stated on the certificate. The underlying cause is defined by the World Health Organization as “the disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence that produced the fatal injury.” Generally, more medical information is reported on death certificates than is directly reflected in the underlying cause of death. Conditions that are not selected as the underlying cause of death constitute the nonunderlying causes of death, also known as multiple cause of death.

Cause of death is coded according to the appropriate revision of the *International Classification of Diseases (ICD)* ([Table III](#)). Effective with deaths occurring in 1999, the United States began using the 10th revision of ICD (ICD–10); during the period 1979–1998, causes of death were coded and classified according to the 9th revision (ICD–9). [Table IV](#) lists ICD codes for the 6th through 10th revisions for causes of death shown in *Health, United States*. In *Health, United States*, common terms are sometimes used in the text in place of medical terminology. Examples include “cancer” for “malignant neoplasm” and “kidney disease” for “nephritis, nephrotic syndrome and nephrosis.”

Each ICD revision has produced discontinuities in cause-of-death trends. These discontinuities are measured by using comparability ratios that are essential to the interpretation of mortality trends ([Table V](#)). For further discussion, see: [https://www.cdc.gov/nchs/nvss/mortality/comparability\\_icd.htm](https://www.cdc.gov/nchs/nvss/mortality/comparability_icd.htm). (Also see [Appendix II](#), Comparability ratio; *International Classification of Diseases* [ICD]; and [Appendix I](#), National Vital Statistics System [NVSS]; Multiple Cause-of-Death File.)

**Cause-of-death ranking**—Selected causes of death of public health and medical importance are compiled into tabulation lists and are ranked according to the number of deaths assigned to these causes. The top-ranking causes determine the leading causes of death. Certain causes on the tabulation lists are not ranked if, for example, the category title represents a group title (such as “Major cardiovascular

**Table III. Revision of the *International Classification of Diseases (ICD)*, by year of conference in which adopted and years in use in the United States**

ICD revision	Year of conference in which revision adopted	Years in use in United States
1st .....	1900	1900–1909
2nd .....	1909	1910–1920
3rd .....	1920	1921–1929
4th .....	1929	1930–1938
5th .....	1938	1939–1948
6th .....	1948	1949–1957
7th .....	1955	1958–1967
8th .....	1965	1968–1978
9th .....	1975	1979–1998
10th .....	1990	1999–present

SOURCE: NCHS. Available from: <https://www.cdc.gov/nchs/icd/icd9.htm>.

diseases” and “Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified”) or the category title begins with the words “Other” or “All other.” In addition, when one of the titles that represents a subtotal (such as “Malignant neoplasms”) is ranked, its component parts are not ranked. The tabulation lists used for ranking in the 10th revision of the *International Classification of Diseases (ICD–10)* include the List of 113 Selected Causes of Death, which replaces the ICD–9 List of 72 Selected Causes, HIV Infection and Alzheimer’s Disease; and the ICD–10 List of 130 Selected Causes of Infant Death, which replaces the ICD–9 List of 60 Selected Causes of Infant Death and HIV Infection. Causes that are tied receive the same rank; the next cause is assigned the rank it would have received had the lower-ranked causes not been tied, that is, a rank is skipped. For more information, see the annual series of “Deaths: Final Data” and “Deaths: Leading Causes” reports, available from: <https://www.cdc.gov/nchs/products/nvsr.htm>. (Also see Appendix II, *International Classification of Diseases [ICD]*.)

**Children’s Health Insurance Program**—Title XXI of the Social Security Act, often referred to as the Children’s Health Insurance Program (CHIP), is a program originally enacted by the Balanced Budget Act of 1997. The Children’s Health Insurance Program Reauthorization Act of 2009 (CHIPRA, P.L. 111–3) reauthorized CHIP and appropriated funding for CHIP through FY 2013. The Affordable Care Act of 2010 (ACA, P.L. 111–148) extended CHIP funding through FY 2015, and the Medicare Access and CHIP Reauthorization Act of 2015 (P.L. 114–10) extended funding with no programmatic changes for CHIP through 2017. A 6-year reauthorization of CHIP was signed into law on January 22, 2018, extending the program through the end of fiscal year 2023. On February 9, 2018, the Bipartisan Budget Act (P.L. 115-123) was signed into law, extending CHIP an additional 4 years. Therefore, CHIP is currently authorized through 2027.

CHIP provides federal funds for states to provide health care coverage to eligible low-income, uninsured children whose income is too high to qualify for Medicaid. Generally,

CHIP is only available through age 18. CHIP gives states broad flexibility in program design within a federal framework that includes important beneficiary protections. Funds from CHIP may be used for a separate child health program or to expand Medicaid. Although CHIP is not part of Medicaid, in some instances in *Health, United States*, data on CHIP and Medicaid are presented together, and those instances are discussed in the footnotes of the respective tables. For more information, see: <https://www.medicaid.gov/chip/index.html>. (Also see Appendix II, Health insurance coverage; Medicaid.)

**Cholesterol**—Serum total cholesterol is a combination of high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol, and very low-density lipoprotein (VLDL) cholesterol. High serum total cholesterol is a risk factor for cardiovascular disease (see: Wilson PW, D’Agostino RB, Levy D, Belanger AM, Silbershatz H, Kannel WB. Prediction of coronary heart disease using risk factor categories. *Circulation* 97(18):1837–47. 1998). In its first report (1988) on high blood cholesterol, the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults provided guidelines for the treatment of high blood cholesterol, defined as a serum total cholesterol value greater than or equal to 240 mg/dL (6.20 mmol/L). This definition was also used in the panel’s second and third reports. A more recent set of guidelines—the result of initial efforts by the National Heart, Lung, and Blood Institute and subsequent efforts by the American College of Cardiology and the American Heart Association—focused on which groups of people could benefit from statin use based on their risk factors. For more information on the current cholesterol guidelines, see: National Heart, Lung, and Blood Institute. Management of blood cholesterol in adults: Systematic evidence review from the Cholesterol Expert Panel. 2013. Available from: <https://www.nhlbi.nih.gov/health-pro/guidelines/in-develop/cholesterol-in-adults>; and Stone NJ, Robinson JG, Lichtenstein AH, Merz CN, Blum CB, Eckel RH, et al. 2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* 129:(25 Suppl 2)S1–45. 2014. Available from: <https://www.ahajournals.org/doi/full/10.1161/01.cir.0000437738.63853.7a>.

Because *Health, United States* focuses on providing population-level prevalence data rather than individual-level estimates, three broad indicators of cholesterol are presented based on measured serum total cholesterol level and the reported use of cholesterol-lowering medications. Cholesterol levels are determined using the National Health and Nutrition Examination Surveys (NHANES) T\_CHOL file. The three measures of total cholesterol that are presented are the following: hypercholesterolemia, high serum total cholesterol, and mean serum total cholesterol. Hypercholesterolemia is based on both laboratory testing and self-reported use of cholesterol-lowering medication. It

**Table IV. Cause-of-death codes, by applicable revision of the *International Classification of Diseases (ICD)***

Cause of death (10th revision titles)	6th and 7th revisions	8th revision	9th revision	10th revision
Communicable diseases . . . . .	...	...	001–139, 460–466, 480–487, 771.3	A00–B99, J00–J22
Chronic and noncommunicable diseases. . . . .	...	...	140–459, 470–478, 490–799	C00–I99, J30–R99
Meningococcal Infection . . . . .	...	...	036	A39
Septicemia . . . . .	...	...	038	A40–A41
Human immunodeficiency virus (HIV) disease <sup>1</sup> . . . . .	...	...	*042–*044	B20–B24
Malignant neoplasms . . . . .	140–205	140–209	140–208	C00–C97
Colon, rectum, and anus . . . . .	153–154	153–154	153–154	C18–C21
Trachea, bronchus, and lung . . . . .	162–163	162	162	C33–C34
Breast . . . . .	170	174	174–175	C50
Prostate. . . . .	177	185	185	C61
In situ neoplasms, benign neoplasms, and neoplasms of uncertain or unknown behavior. . . . .	210–239	210–239	210–239	D00–D48
Diabetes mellitus . . . . .	260	250	250	E10–E14
Anemias . . . . .	...	...	280–285	D50–D64
Meningitis. . . . .	...	...	320–322	G00, G03
Alzheimer’s disease . . . . .	...	...	331.0	G30
Diseases of heart . . . . .	400–402, 410–443	390–398, 402, 404, 410–429	390–398, 402, 404, 410–429	I00–I09, I11, I13, I20–I51
Ischemic heart disease . . . . .	...	...	410–414, 429.2	I20–I25
Essential hypertension and hypertensive renal disease . . . . .	...	...	...	I10, I12, I15
Cerebrovascular diseases . . . . .	330–334	430–438	430–434, 436–438	I60–I69
Atherosclerosis. . . . .	...	...	440	I70
Influenza and pneumonia <sup>2</sup> . . . . .	480–483, 490–493	470–474, 480–486	480–487	J09–J18
Chronic lower respiratory diseases . . . . .	241, 501, 502, 527.1	490–493, 519.3	490–494, 496	J40–J47
Chronic liver disease and cirrhosis . . . . .	581	571	571	K70, K73–K74
Nephritis, nephrotic syndrome and nephrosis . . . . .	...	...	580–589	N00–N07, N17–N19, N25–N27
Pregnancy, childbirth, and the puerperium . . . . .	640–689	630–678	630–676	O00–O99
Congenital malformations, deformations and chromosomal abnormalities. . . . .	...	...	740–759	Q00–Q99
Certain conditions originating in the perinatal period . . . . .	...	...	760–779	P00–P96
Newborn affected by maternal complications of pregnancy . . . . .	...	...	761	P01
Newborn affected by complications of placenta, cord, and membranes. . . . .	...	...	762	P02
Disorders related to short gestation and low birthweight, not elsewhere classified . . . . .	...	...	765	P07
Birth trauma . . . . .	...	...	767	P10–P15
Intrauterine hypoxia and birth asphyxia . . . . .	...	...	768	P20–P21
Respiratory distress of newborn . . . . .	...	...	769	P22
Bacterial sepsis of newborn . . . . .	...	...	...	P36
Necrotizing enterocolitis of newborn. . . . .	...	...	777.5	P77
Sudden infant death syndrome . . . . .	...	...	798.0	R95
Injuries <sup>2</sup> . . . . .	...	...	E800–E869, E880–E929, E950–E999	*U01–*U03, V01–Y36, Y85–Y87, Y89
Unintentional injuries <sup>3</sup> . . . . .	E800–E936, E960–E965	E800–E929, E940–E946	E800–E869, E880–E929	V01–X59, Y85–Y86
Motor vehicle-related injuries <sup>3</sup> . . . . .	E810–E835	E810–E823	E810–E825	V02–V04, V09.0, V09.2, V12–V14, V19.0–V19.2, V19.4–V19.6, V20–V79, V80.3–V80.5, V81.0– V81.1, V82.0–V82.1, V83–V86, V87.0–V87.8, V88.0–V88.8, V89.0, V89.2
Poisoning. . . . .	E870–E888, E890–E895	E850–E877	E850–E869	X40–X49

See footnotes at end of table.

**Table IV. Cause-of-death codes, by applicable revision of the *International Classification of Diseases (ICD)*—Con.**

Cause of death (10th revision titles)	6th and 7th revisions	8th revision	9th revision	10th revision
Suicide <sup>2</sup> . . . . .	E963, E970–E979	E950–E959	E950–E959	*U03, X60–X84, Y87.0
Homicide <sup>2</sup> . . . . .	E964, E980–E983	E960–E969	E960–E969	*U01–*U02, X85–Y09, Y87.1
Firearm-related injury . . . . .	...	E922, E955, E965, E970, E985	E922, E955.0–E955.4, E965.0–E965.4, E970, E985.0–E985.4	*U01.4, W32–W34, X72–X74, X93–X95, Y22–Y24, Y35.0
Injury by drug overdose . . . . .	...	...	...	X40–X44, X60–X64, X85, Y10–Y14
Any opioid . . . . .	...	...	...	X40–X44, X60–X64, X85, Y10–Y14 (underlying cause) and T40.0–T40.4, T40.6 (multiple cause)
Heroin . . . . .	...	...	...	X40–X44, X60–X64, X85, Y10–Y14 (underlying cause) and T40.1 (multiple cause)
Natural and semisynthetic opioids . . . . .	...	...	...	X40–X44, X60–X64, X85, Y10–Y14 (underlying cause) and T40.2 (multiple cause)
Methadone . . . . .	...	...	...	X40–X44, X60–X64, X85, Y10–Y14 (underlying cause) and T40.3 (multiple cause)
Other synthetic opioids (other than methadone) . . . . .	...	...	...	X40–X44, X60–X64, X85, Y10–Y14 (underlying cause) and T40.4 (multiple cause)

... Category not applicable. Cause-of-death codes are not provided for causes not shown in *Health, United States*.

<sup>1</sup>Categories for coding human immunodeficiency virus (HIV) infection were introduced in 1987. The asterisk (\*) indicates codes that are not part of ICD–9.

<sup>2</sup>Starting with 2001 data, the National Center for Health Statistics (NCHS) introduced categories \*U01–\*U03 for classifying and coding deaths due to acts of terrorism. The asterisk (\*) indicates codes that are not part of ICD–10. Starting with 2007 data, NCHS introduced the category J09 for coding avian influenza virus. In 2009, the title for the ICD–10 code J09 was changed from “Influenza due to identified avian influenza virus” to “Influenza due to certain identified influenza virus.” This change was made to accommodate deaths from influenza A (H1N1) virus in the ICD–10 code J09 for data years 2009 and beyond.

<sup>3</sup>In the public health community, the term “unintentional injuries” is preferred to accidents, and the term “motor vehicle-related injuries” is preferred to motor vehicle accidents.

SOURCE: NCHS. Advance report: Final mortality statistics, 1974. Monthly Vital Statistics Report; vol 24 no 11 suppl. Hyattsville, MD: National Center for Health Statistics. 1976. Available from: [https://www.cdc.gov/nchs/data/mvsr/supp/mv24\\_11sacc.pdf](https://www.cdc.gov/nchs/data/mvsr/supp/mv24_11sacc.pdf); Hoyert DL, Kochanek KD, Murphy SL. Deaths: Final data for 1997. National Vital Statistics Reports; vol 47 no 19. Hyattsville, MD: National Center for Health Statistics. 1999. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr47/nvs47\\_19.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr47/nvs47_19.pdf); Hoyert DL, Heron MP, Murphy SL, Kung HC. Deaths: Final data for 2003. National Vital Statistics Reports; vol 54 no 13. Hyattsville, MD: National Center for Health Statistics. 2006. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr54/nvsr54\\_13.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr54/nvsr54_13.pdf); Murphy SL, Xu JQ, Kochanek KD. Deaths: Final data for 2010. National Vital Statistics Reports; vol 61 no 4. Hyattsville, MD: National Center for Health Statistics. 2013. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61\\_04.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_04.pdf); Kochanek KD, Murphy SL, Xu JQ, Arias E. Deaths: Final data for 2017. National Vital Statistics Reports. Hyattsville, MD: National Center for Health Statistics. 2019. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68\\_09-508.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_09-508.pdf).

is defined as measured serum total cholesterol greater than or equal to 240 mg/dL (6.20 mmol/L) or reporting taking cholesterol-lowering medications. Respondents who were told by a doctor or health professional that their cholesterol was high, were told by a doctor to take cholesterol-lowering medication, and who answered “yes” to the question, “Are you now following this advice to take prescribed medicine?” were classified as taking cholesterol-lowering medication. High serum total cholesterol is defined as measured serum total cholesterol greater than or equal to 240 mg/dL (6.20 mmol/L). Both high serum total cholesterol and mean serum total cholesterol are based on serum samples collected during the NHANES examination.

As part of the NHANES examination, venous blood serum samples collected from NHANES participants at mobile examination centers (MEC) were frozen and shipped on dry ice to the laboratory conducting the lipid analyses. Serum total cholesterol was measured on all examined adults regardless of whether they had fasted, and data were analyzed regardless of fasting status. Cholesterol measurements are standardized according to the criteria of the Centers for Disease Control and Prevention (CDC)—and later the CDC–National Heart, Lung, and Blood Institute Lipids Standardization Program—to ensure comparable and accurate measurements. For more information, see: Myers GL, Cooper GR, Winn CL, Smith SJ. The Centers for Disease Control–National Heart, Lung, and Blood Institute Lipid Standardization Program: An approach to accurate and precise lipid measurements. *Clin Lab Med* 9(1):105–35. 1989. A detailed summary of the procedures used for measurement of total cholesterol in earlier NHANES years has been published in: Carroll MD, Kit BK, Lacher DA, Shero ST, Mussolino ME. Trends in lipids and lipoproteins in U.S. adults, 1988–2010. *JAMA* 308(15):1545–54. 2012. A description of the laboratory procedures for the total cholesterol measurement for different NHANES years is published by the National Center for Health Statistics and is available from: <https://www.cdc.gov/nchs/nhanes/index.htm>.

**Cigarette smoking**—Estimates of cigarette smoking among adults and youths from several sources are presented in *Health, United States*. In addition, cigarette smoking may be considered in estimates of the use of tobacco products. (For information on how cigarette smoking is defined for estimates in *Health, United States*, see [Appendix II](#), Tobacco use.)

**Civilian noninstitutionalized population; Civilian population**—See [Appendix II](#), Population.

**Community hospital**—See [Appendix II](#), Hospital.

**Comparability ratio**—About every 10 to 20 years, the *International Classification of Diseases* (ICD) is revised to stay abreast of advances in medical science and changes in medical terminology. Each of these revisions produces breaks in the continuity of cause-of-death statistics because of changes in classification and in the rules for selecting an underlying cause of death. Classification and rule changes

affect cause-of-death trend data by shifting deaths away from some cause-of-death categories and into others. Comparability ratios measure the effect of changes in classification and coding rules. For the causes shown in [Table V](#), comparability ratios range between 0.6974 and 1.5812. Influenza and pneumonia had the lowest comparability ratio (0.6974), indicating that this cause is about 30% less likely to be selected as the underlying cause of death under the 10th revision of ICD (ICD–10) than under the 9th revision (ICD–9). Alzheimer’s disease had the highest comparability ratio (1.5812), indicating that Alzheimer’s disease is 58% more likely to be selected as the underlying cause when ICD–10 coding is used.

For selected causes of death, the ICD–9 codes used to calculate death rates for 1980–1998 differ from the ICD–9 codes most nearly comparable with the corresponding ICD–10 cause-of-death category, which also affects the ability to compare death rates across ICD revisions. Examples of these causes are Ischemic heart disease; Cerebrovascular diseases; Trachea, bronchus, and lung cancer; Unintentional injuries;

**Table V. Comparability of selected causes of death between the 9th and 10th revisions of the *International Classification of Diseases* (ICD)**

Cause of death <sup>1</sup>	Final comparability ratio <sup>2</sup>
Human immunodeficiency virus (HIV) disease . . . . .	1.0821
Malignant neoplasms . . . . .	1.0093
Colon, rectum, and anus . . . . .	0.9988
Trachea, bronchus, and lung . . . . .	0.9844
Breast . . . . .	1.0073
Prostate . . . . .	1.0144
Diabetes mellitus . . . . .	1.0193
Alzheimer’s disease . . . . .	1.5812
Diseases of heart . . . . .	0.9852
Ischemic heart diseases . . . . .	1.0006
Essential (primary) hypertension and hypertensive renal disease . . . . .	1.1162
Cerebrovascular diseases . . . . .	1.0502
Influenza and pneumonia . . . . .	0.6974
Chronic lower respiratory diseases . . . . .	1.0411
Chronic liver disease and cirrhosis . . . . .	1.0321
Nephritis, nephrotic syndrome and nephrosis . . . . .	1.2555
Pregnancy, childbirth, and the puerperium . . . . .	1.1404
Unintentional injuries . . . . .	1.0251
Motor vehicle-related injuries . . . . .	0.9527
Poisoning . . . . .	1.0365
Suicide . . . . .	1.0022
Homicide . . . . .	1.0020
Firearm-related injury . . . . .	1.0012
Chronic and noncommunicable diseases . . . . .	1.0100
Injuries . . . . .	1.0159

<sup>1</sup>See [Table IV](#) in this report for ICD–9 and ICD–10 cause-of-death codes.

<sup>2</sup>Ratio of number of deaths classified by ICD–10 to number of deaths classified by ICD–9.

SOURCES: NCHS. [Table 1](#). Final and preliminary comparability ratios for 113 selected causes of death. Available from: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Datasets/Comparability/icd9\\_icd10/Comparability\\_Ratio\\_tables.xls](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/Comparability/icd9_icd10/Comparability_Ratio_tables.xls); Miniño AM, Anderson RN, Fingerhut LA, Boudreault MA, Warner M. Deaths: Injuries, 2002. National Vital Statistics Reports; vol 54 no 10. Hyattsville, MD: National Center for Health Statistics. 2006. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr54/nvsr54\\_10.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr54/nvsr54_10.pdf).

and Homicide. To address this source of discontinuity, mortality trends for 1980–1998 were recalculated using ICD–9 codes that are more comparable with codes for corresponding ICD–10 categories. [Table IV](#) shows the ICD–9 codes used for these causes. This modification may lessen the discontinuity between the 9th and 10th revisions, but the effect on the discontinuity between the 8th and 9th revisions is not measured.

Comparability ratios shown in [Table V](#) are based on a comparability study in which the same deaths were coded using both the 9th and 10th revisions. The comparability ratio was calculated by dividing the number of deaths classified using ICD–10 by the number of deaths classified using ICD–9. The resulting ratios represent the net effect of the 10th revision on cause-of-death statistics and can be used to adjust mortality statistics for causes of death classified by the 9th revision to be comparable with cause-specific mortality statistics classified by the 10th revision.

The application of comparability ratios to mortality statistics helps make the analysis of change between 1998 and 1999 more accurate and complete. The 1998 comparability-modified death rate is calculated by multiplying the comparability ratio by the 1998 death rate. Comparability-modified rates should be used to estimate mortality change between 1998 and 1999.

Applying the comparability ratios presented in [Table V](#) to age-, race-, and sex-specific mortality data may not be appropriate. Demographic subgroups may differ with regard to their cause-of-death distribution, and this would result in demographic variation in cause-specific comparability ratios.

For more information, see: Anderson RN, Miniño AM, Hoyert DL, Rosenberg HM. Comparability of cause of death between ICD–9 and ICD–10: Preliminary estimates. *National Vital Statistics Reports*; vol 49 no 2. Hyattsville, MD: National Center for Health Statistics. 2001. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr49/nvsr49\\_02.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr49/nvsr49_02.pdf); Kochanek KD, Smith BL, Anderson RN. Deaths: Preliminary data for 1999. *National Vital Statistics Reports*; vol 49 no 3. Hyattsville, MD: National Center for Health Statistics. 2001. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr49/nvsr49\\_03.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr49/nvsr49_03.pdf); Final ratios for 113 selected causes of death, available from: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Datasets/Comparability/icd9\\_icd10/](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/Comparability/icd9_icd10/); and the ICD comparability ratio website at: [https://www.cdc.gov/nchs/nvss/mortality/comparability\\_icd.htm](https://www.cdc.gov/nchs/nvss/mortality/comparability_icd.htm). (Also see [Appendix II](#), Cause of death; *International Classification of Diseases* [ICD].)

**Consumer Price Index (CPI)**—A measure of the average change in prices of goods and services purchased by urban households. The CPI is prepared by the U.S. Bureau of Labor Statistics. The medical care component of CPI shows trends in medical care prices based on specific indicators of hospital, medical, and drug prices. A revised definition of CPI has been in use since January 1988. (Also see [Appendix II](#), Gross domestic product [GDP]; and Health expenditures, national.)

**Crude birth rate; Crude death rate**—See [Appendix II](#), Rate: Birth and related rates; Rate: Death and related rates.

**Data presentation standards for proportions**—*Health, United States, 2017* employed data presentation standards for proportions (usually multiplied by 100 and expressed as percentages) for selected National Center for Health Statistics (NCHS) data sources and years. The multistep standards are described in the report, “National Center for Health Statistics Data Presentation Standards for Proportions.” This multistep approach is based on minimum denominator sample sizes, the absolute and relative widths of a 95% confidence interval calculated using the Clopper-Pearson method and adapted for complex surveys by Korn and Graubard, and degrees of freedom. Using these standards, estimates identified as statistically unreliable (or whose complementary proportions are unreliable) are suppressed (or flagged). This approach was chosen because it performs well for proportions near 0 or 1, incorporates information from the complex survey design including the effective sample sizes, and is generally conservative (i.e., a 95% Clopper-Pearson confidence interval includes the true proportion more than 95% of the time).

This multistep approach was identified after a review of current standards, the purpose and scope of the data collection, and advances in statistical methodology. The use of the Korn-Graubard modification of the Clopper-Pearson confidence interval for proportions is considered an improvement over the commonly used Wald confidence interval, which is known for its undercoverage (i.e., a 95% Wald confidence interval includes the true proportion less than 95% of the time).

Starting with *Health, United States, 2017* this multistep approach has been applied to estimates from the 2015–2016 and 2013–2016 National Health and Nutrition Examination Surveys and the 2016 National Health Interview Survey. The reliability of estimates for prior data years was evaluated based on relative standard errors. In the Chartbook figures and data tables, all estimates are presented in accordance with these standards.

For more information on the recently developed multistep approach, see: Parker JD, Talih M, Malec DJ, Beresovsky V, Carroll M, Gonzalez Jr JF, et al. National Center for Health Statistics data presentation standards for proportions. Hyattsville, MD: National Center for Health Statistics. *Vital Health Stat* 2(175). 2017. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_175.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf). (Also see [Appendix II](#), Relative standard error [RSE]).

**Death rate**—See [Appendix II](#), Rate: Death and related rates.

**Dental caries**—Evidence of decay on the crown or enamel surface of a tooth (i.e., coronal caries) including treated and untreated caries. Untreated dental caries refers to decay on the crown or enamel surface of a tooth (i.e., coronal caries) that has not been treated or filled. Decay in the root (i.e., root caries) was not included.

In *Health, United States*, estimates of the presence of caries are based on evaluation of primary and permanent teeth for persons aged 5 and over. The third molars were not included. Persons without at least one natural tooth (primary

or permanent) were classified as edentulous (without any teeth) and were excluded. The majority of edentulous persons are aged 65 and over. Estimates of edentulism among persons aged 65 and over were 33% in 1988–1994, 23% in 2005–2008, and 15% in 2013–2016.

Dental caries was identified by an oral examination as part of the National Health and Nutrition Examination Survey (NHANES). Over time, there have been changes in the NHANES oral health examination process, ages examined, and methodology. During 1988–1994, a full-mouth complete oral health examination was conducted by a trained dentist on those aged 1 and over. During 1999–2004, a full-mouth complete oral health examination was conducted by a trained dentist on those aged 2 and over. During 2005–2008, data were collected for those aged 5 and over by a trained health technologist using the Basic Screening Examination (BSE), a simplified screening process to collect information on untreated caries, dental restorations, and dental sealants. During 2009–2010, the BSE was conducted by a trained dental hygienist on those aged 3–19. No data on adults were collected. During 2005–2008 and 2009–2010, the use of the BSE does not allow analysts to determine if untreated decay was found in permanent teeth or primary teeth. For 2011–2014 data, a full-mouth complete oral health examination was conducted by a trained dentist on those aged 1 and over.

For more information, see: Dye BA, Barker LK, Li X, Lewis BG, Beltrán-Aguilar ED. Overview and quality assurance for the oral health component of the National Health and Nutrition Examination Survey (NHANES), 2005–08. *J Public Health Dent* 71(1):54–61. 2011, and the following NHANES resources: [https://wwwn.cdc.gov/nchs/nhanes/2007-2008/OHX\\_E.htm](https://wwwn.cdc.gov/nchs/nhanes/2007-2008/OHX_E.htm), [https://wwwn.cdc.gov/nchs/nhanes/2009-2010/OHXDEN\\_F.htm](https://wwwn.cdc.gov/nchs/nhanes/2009-2010/OHXDEN_F.htm), [https://wwwn.cdc.gov/nchs/nhanes/2013-2014/OHXDEN\\_H.htm](https://wwwn.cdc.gov/nchs/nhanes/2013-2014/OHXDEN_H.htm), and [https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/OHXDEN\\_I.htm](https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/OHXDEN_I.htm).

**Dental visit**—Starting in 1997, National Health Interview Survey respondents were asked, “About how long has it been since you last saw or talked to a dentist? Include all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists as well as hygienists.” Starting in 2001, the question was modified slightly to ask respondents how long it had been since they last saw a dentist. Questions about dental visits were not asked for children under age 2 for years 1997–1999 and under age 1 for years 2000 and beyond. Starting with 1997 data, estimates are presented for people with a dental visit in the past year.

**Diabetes**—A group of conditions in which insulin is not adequately secreted or utilized. Diabetes is a leading cause of disease and death in the United States. Using data from the National Health and Nutrition Examination Survey (NHANES), three measures of diabetes are presented in *Health, United States*: physician-diagnosed diabetes, undiagnosed diabetes, and total diabetes. All three of these measures presented in *Health, United States* include type 1 and type 2 diabetes.

- **Physician-diagnosed diabetes**—Physician-diagnosed diabetes data were obtained by self-report.

Respondents who answered “yes” to the question, “Other than during pregnancy, have you ever been told by a doctor or health professional that you have diabetes or sugar diabetes?” were classified as having physician-diagnosed diabetes.

- **Undiagnosed diabetes**—NHANES respondents who were not classified as having physician-diagnosed diabetes were evaluated for undiagnosed diabetes using laboratory testing of whole blood and blood plasma samples collected at mobile examination centers (MECs). Undiagnosed diabetes was defined as fasting plasma glucose (FPG) of at least 126 mg/dL or a hemoglobin A1c of at least 6.5%. Elevated hemoglobin A1c was included as a component of the definition of undiagnosed diabetes starting with *Health, United States, 2010*. For more information, see: Diagnosis and classification of diabetes mellitus. *Diabetes Care* 38(Suppl 1):S8–S16. 2015; Standards of medical care in diabetes—2010. *Diabetes Care* 33(Suppl 1):S11–S61. 2010; and International Expert Committee Report on the role of the A1c assay in the diagnosis of diabetes. *Diabetes Care* 32(7):1327–34. 2009. To ensure data comparability over time, the revised definition of undiagnosed diabetes was applied to all estimates shown. As expected, this revised definition increased the percentage of participants classified as having undiagnosed diabetes.

Fasting plasma glucose was obtained from participants who were examined in the morning and had fasted for at least 8 hours and less than 24 hours at the time of blood draw. Estimates in the current edition of *Health, United States* may differ from prior editions, since those may have only included participants who had fasted for at least 9 hours and less than 24 hours.

Fasting is not necessary to measure hemoglobin A1c. However, to be consistent with the subsample of fasting participants used for FPG, assessment of undiagnosed diabetes in *Health, United States* is limited to the fasting subsample.

Periodically, NHANES laboratory testing is performed at different laboratories using different instruments than testing in earlier years. In those instances, NHANES conducts crossover studies to evaluate the impact of these changes on laboratory measurements, and thus their impact on the evaluation of data over time. Crossover studies have been conducted to evaluate the impact of laboratory changes on both FPG and hemoglobin A1c. In order to account for laboratory changes for 2005–2006 to the present, the recommended forward adjustments to FPG have been incorporated in estimates presented in *Health, United States* so that they are compatible with estimates from the most recent NHANES survey cycle. NHANES does not recommend any adjustments to the hemoglobin A1c data.

For more information on the recommended FPG adjustments, see the Plasma Fasting Glucose documentation for 2015–2016 ([https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/GLU\\_I.htm](https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/GLU_I.htm)), 2007–2008 ([https://wwwn.cdc.gov/Nchs/Nhanes/2007-2008/GLU\\_E.htm](https://wwwn.cdc.gov/Nchs/Nhanes/2007-2008/GLU_E.htm)), and 2005–2006 ([https://wwwn.cdc.gov/nchs/nhanes/2005-2006/GLU\\_D.htm](https://wwwn.cdc.gov/nchs/nhanes/2005-2006/GLU_D.htm)).

- **Total diabetes**—Total diabetes includes those who were classified as having either physician-diagnosed or undiagnosed diabetes.

Poor glycemic control is also a measure that appears in *Health, United States*. Poor glycemic control is defined as a hemoglobin A1c of greater than 9% among persons with physician-diagnosed diabetes.

**Diagnosis**—The act or process of identifying or determining the nature and cause of a disease or injury through evaluation of patient history, examination of a patient, and review of laboratory data.

For a given medical care encounter, the first-listed diagnosis can be used to categorize the visit, or if more than one diagnosis is recorded on the medical record, the visit can be categorized based on all diagnoses recorded. Analyzing first-listed diagnoses avoids double-counting events such as visits or hospitalizations; the first-listed diagnosis is often, but not always, considered the most important or dominant condition among all comorbid conditions. However, the choice of the first-listed diagnosis by the medical facility may be influenced by reimbursement or other factors.

**Drug**—*National Health and Nutrition Examination Survey (NHANES)*—Drug information from NHANES III and from NHANES 1999–2000 and later was collected during in-person interviews conducted in participants’ homes. Starting with 2001–2002 data, participants were asked whether they had taken medication in the past 30 days for which they needed a prescription. For NHANES III and for NHANES 1999–2000, the question wording differed slightly; participants were asked whether they had taken a prescription medication in the past month. For all survey years, those who answered “yes” were asked to provide the prescription medication containers for the interviewer. For each medication reported, the interviewer entered the product’s complete name from the container. If no container was available, the interviewer asked the participant to verbally report the name of the medication. In addition, participants were asked how long they had been taking the medication and the main reason for use.

Drug data from NHANES provide a snapshot of all prescribed drugs reported by a sample of the civilian noninstitutionalized population for a 30-day period (or past month, for earlier survey years). Drugs taken on an irregular basis, such as every other day, once per week, or for a 10-day period, were captured in the 30-day recall period. Data shown in *Health, United States* for the percentage of the population reporting multiple prescription drugs during the past 30 days include a range of drug utilization patterns; for example, persons who took three or more drugs daily during

the past 30 days or persons who took a different drug three separate times would be classified as taking three or more drugs in the past 30 days, as long as at least three drugs were taken at some time during the past 30 days.

For more information on prescription drug data collection and coding in NHANES, see: [https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/RXQ\\_RX\\_I.htm](https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/RXQ_RX_I.htm), and [https://wwwn.cdc.gov/Nchs/Nhanes/1999-2000/RXQ\\_DRUG.htm](https://wwwn.cdc.gov/Nchs/Nhanes/1999-2000/RXQ_DRUG.htm).

For more information on NHANES III prescription drug data collection and coding, see: <https://wwwn.cdc.gov/nchs/data/nhanes3/2a/pupremed.pdf>. The small number of respondents (fewer than 10) who responded “unknown” to whether they were taking prescription medication was coded as not taking prescription drugs in the past month. (Also see [Appendix I](#), National Health and Nutrition Examination Survey [NHANES].)

**Drug abuse**—See [Appendix II](#), Illicit drug use.

**Education**—Several approaches to defining educational categories are used in *Health, United States*. Estimates are typically presented for adults aged 25 and over in order to give people time to complete their education.

*National Health and Nutrition Examination Survey (NHANES)*—In 1988–1994 (NHANES III) the questionnaire asked, “What is the highest grade or year of regular school [person] has completed?” Responses were used to categorize adults according to educational credentials (i.e., no high school diploma or GED; high school diploma or GED; some college, no bachelor’s degree; bachelor’s degree or higher). Starting with 1999–2000 data, the questionnaire was changed to ask, “What is the highest grade or level of school [you have/(person) has] completed or the highest degree you have/(person) has received?” For data on children, education is based on the level of education completed by the head of the household.

*National Health Interview Survey (NHIS)*—Starting in 1997, the NHIS questionnaire was changed to ask, “What is the highest level of school [person] has completed or the highest degree received?” Responses were used to categorize adults according to educational credentials (i.e., no high school diploma or general educational development high school equivalency diploma [GED]; high school diploma or GED; some college, no degree; associate’s degree; bachelor’s degree or higher).

Prior to 1997, the education variable in NHIS was measured by asking, “What is the highest grade or year of regular school [person] has ever attended?” and “Did [person] finish the grade/year?” Responses were used to categorize adults according to years of education completed (i.e., less than 12, 12, 13–15, or 16 years or more).

Data from the 1996 and 1997 NHIS were used to compare distributions of educational attainment for adults aged 25 and over, using categories based

on educational credentials (1997) and categories based on years of education completed (1996). A larger percentage of persons reported some college than reported 13–15 years of education, and a correspondingly smaller percentage reported a high school diploma or GED than reported 12 years of education. In 1996, 18% of adults reported less than 12 years of education, 37% reported 12 years, 20% reported 13–15 years, and 25% reported 16 or more years of education. In 1997, 19% of adults reported no high school diploma, 31% reported a high school diploma or GED, 26% reported some college, and 24% reported a bachelor's degree or higher.

**Emergency department or emergency room visit—**

Starting with the 1997 National Health Interview Survey, respondents to the Sample Adult questionnaire and the Sample Child questionnaire (a knowledgeable adult, usually a parent) were asked about the number of visits to hospital emergency rooms during the past 12 months, including visits that resulted in hospitalization.

**Ethnicity—**See [Appendix II](#), Hispanic origin.

**Exercise—**See [Appendix II](#), Physical activity, leisure-time.

**Expenditures—**See [Appendix II](#), Health expenditures, national. (Also see [Appendix I](#), National Health Expenditure Accounts [NHEA].)

**Family income—**For the National Health Interview Survey and the National Health and Nutrition Examination Survey, all people within a household who are related by blood, marriage or cohabitation, or adoption constitute a family. Each member of a family is classified according to the total income of the family. Unrelated individuals are classified according to their own income.

*National Health and Nutrition Examination Survey (NHANES)*—In NHANES 1999 and onward, family income is asked in a series of questions about possible sources of income, including wages, salaries, interest and dividends, federal programs, child support, rents, royalties, and other possible sources. After the information about sources of income was obtained in the family interview income section of the questionnaire, respondents were asked to report total combined family income for themselves and the other members of their family, in dollars. If respondents did not provide an answer or did not know the total combined family income, they were asked if the total family income was less than \$20,000 or \$20,000 or more. If respondents answered, a follow-up question asked them to select an income range from a list on a printed flash card. The midpoint of the income range was then used as the total family income value. Family income values are used to calculate a poverty measure. NHANES II (1976–1980) included questions on components of income; NHANES III (1988–1994) did not ask the detailed components-of-income questions but asked respondents to identify their income based

on a set of ranges provided on a flash card. Family income was not imputed for individuals or families with no reported income information in any of the NHANES survey years. (Also see [Appendix II](#), Poverty.)

*National Health Interview Survey (NHIS)*—Prior to 1997, family income was the total income received by members of a family (or by an unrelated individual) in the 12 months before the interview. Family income included wages, salaries, rents from property, interest, dividends, profits and fees from their own businesses, pensions, and help from relatives. Starting in 1997, NHIS collected family income data for the calendar year prior to the interview (e.g., 2015 family income data were based on calendar year 2014 information). The 1997–2006 instrument allowed the respondent to supply a specific dollar amount (up to \$999,995). Any family income responses greater than \$999,995 were entered as \$999,996. Respondents who did not know or refused to give a dollar amount in response to this question were asked if their total combined family income for the previous year was \$20,000 or more, or less than \$20,000. If respondents answered this question, they were given one of two flash cards and asked to indicate which income group listed on the card best represented their family's combined income during the previous calendar year. One flash card listed incomes that were \$20,000 or more, and the other flash card listed incomes that were less than \$20,000. For the 2007–2010 NHIS, the income amount follow-up questions that had been in place since 1997 were replaced with a series of unfolding bracket questions. The unfolding bracket method asked a series of closed-ended income range questions (e.g., “Is it less than \$50,000?”) if the respondent did not provide an answer to the exact-income amount question. The closed-ended income range questions were constructed so that each successive question established a smaller range for the amount of the family's income. Since the 2011 NHIS, the unfolding-bracket income questions were further refined to improve the assignment of poverty status.

For the most recent information on the family income questions, see: Section VII. Income and assets section (FIN). In: 2017 National Health Interview Survey (NHIS) public use data release: Survey description. 2018. Available from: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/NHIS/2017/srvydesc.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2017/srvydesc.pdf).

Also see: Pleis JR, Cohen RA. Impact of income bracketing on poverty measures used in the National Health Interview Survey's Early Release Program: Preliminary data from the 2007 NHIS. 2007. Available from: <https://www.cdc.gov/nchs/data/nhis/income.pdf>.

For NHIS respondents, family income data are used in the computation of a poverty measure.

Starting with *Health, United States, 2004*, multiple imputation of family income data was performed for the

**Table VI. High blood pressure in adults aged 20 and over, based on two definitions of high blood pressure: United States, 1999–2002 and 2013–2016**

Characteristic	1999–2002		2013–2016	
	Systolic pressure of at least 140 mm Hg or diastolic pressure of at least 90 mm Hg <sup>1</sup>	Systolic pressure of at least 130 mm Hg or diastolic pressure of at least 80 mm Hg <sup>2</sup>	Systolic pressure of at least 140 mm Hg or diastolic pressure of at least 90 mm Hg <sup>1</sup>	Systolic pressure of at least 130 mm Hg or diastolic pressure of at least 80 mm Hg <sup>2</sup>
20 years and over, age adjusted <sup>3</sup>			Percent	
Both sexes	19.9	42.9	14.9	34.0
Male	19.1	47.5	16.6	38.2
Female	20.2	37.7	13.1	29.7
Not Hispanic or Latino				
White only	18.3	41.3	13.4	32.0
Black or African American only	28.7	54.0	23.3	44.8
Asian only	---	---	16.1	35.6
Hispanic or Latino				
Mexican origin	21.6	41.1	15.6	34.4
20 years and over, crude				
Both sexes	19.9	43.1	16.0	35.6
Male	18.2	46.8	17.0	38.8
Female	21.6	39.5	15.1	32.6
Not Hispanic or Latino				
White only	19.7	43.1	15.7	35.3
Black or African American only	26.3	52.1	22.8	44.4
Asian only	---	---	15.3	34.7
Hispanic or Latino				
Mexican origin	13.9	31.9	12.7	30.5
20–44	7.1	27.6	6.2	20.8
45–64	23.0	52.0	18.2	42.7
65–74	44.9	67.6	28.8	52.0
75 and over	59.1	75.6	42.2	61.0

--- Data not available.

<sup>1</sup>These blood pressure definitions are consistent with the National Heart, Lung, and Blood Institute. See: The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. NIH publication no. 04–5230. 2004. Available from: <https://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.pdf>.

<sup>2</sup>These definitions are based on guidelines released in October 2017 by the American College of Cardiology and the American Heart Association. These guidelines have lower standards for defining high blood pressure. Available from: <http://www.acc.org/latest-in-cardiology/ten-points-to-remember/2017/11/09/11/41/2017-guideline-for-high-blood-pressure-in-adults>.

<sup>3</sup>Estimates are age adjusted to the year 2000 standard population using five age groups: 20–34 years, 35–44 years, 45–54 years, 55–64 years, and 65 years and over.

NOTES: Estimates of high blood pressure do not take into consideration the use of antihypertensive medication. Percentages are based on the average of three blood pressure measurements taken. Pregnant women are excluded.

SOURCE: NCHS, National Health and Nutrition Examination Survey (NHANES).

NHIS survey years 1997 and beyond, with five sets of imputed values created to allow for the assessment of variability caused by imputation. A detailed description of the multiple imputation procedure and data files for 1997 and beyond are available from [https://www.cdc.gov/nchs/nhis/quest\\_data\\_related\\_1997\\_forward.htm](https://www.cdc.gov/nchs/nhis/quest_data_related_1997_forward.htm), through the “Data Release” or the “Imputed Income Files” link under that year.

For data years 1990 through 1996, about 16% to 18% of persons had missing data for family income. In those years, missing values were imputed for family income using a sequential hot-deck, within-matrix, cells-imputation approach. A detailed description of the imputation procedure and data files, with imputed annual family income for 1990 through 1996, is available from: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/)

[Datasets/NHIS/1990-96\\_Family\\_Income/](#). (Also see [Appendix II](#), Poverty; [Table VII](#).)

*National Immunization Surveys (NIS)*—Prior to 1998, family income was the total income received by all family members in the past 12 months at the time of interview. Starting in 1998, the NIS questions on family income collected income received by all family members for the calendar year prior to the interview year for households with age-eligible children, similar to the NHIS. Family income is the combined total income received by all members of a family before taxes. For the family income questions, the household respondent is asked to include income received from jobs; Social Security; retirement income; unemployment payments; public assistance; interest; dividends; net income from business, farm, rent; or any other sources.

**Table VII. Imputed family income percentages in the National Health Interview Survey, by age and sex: United States, 1990–2017**

Year	Both sexes						Females				
	All ages (years)	Under 18	18 and over	Under 65	1–64	18–64	65 and over	2 and over	45 and over	18 and over	40 and over
	Percent										
1990	16	14	18	15	15	16	24	17	22	18	21
1991	18	15	19	17	17	17	26	18	23	19	23
1992	18	16	19	17	17	18	27	18	23	20	23
1993	16	14	17	15	15	16	23	16	20	17	19
1994	17	15	18	16	16	17	25	17	21	18	21
1995	16	14	16	15	15	15	22	16	19	17	19
1996	17	14	17	16	16	16	24	17	20	18	20
1997	24	21	26	23	23	24	34	25	30	26	30
1998	29	25	30	27	27	28	39	29	34	30	34
1999	31	27	32	29	29	30	43	31	37	33	37
2000	32	28	33	30	31	31	45	32	38	34	38
2001	32	27	33	30	30	31	44	32	38	34	37
2002	32	28	33	30	30	31	44	32	37	33	37
2003	33	30	35	32	32	33	44	34	38	35	38
2004	33	29	34	31	31	32	41	33	37	34	36
2005	33	29	34	31	31	32	44	33	38	35	37
2006	34	31	35	33	33	33	45	34	39	36	39
2007	33	29	34	31	31	32	43	33	37	35	38
2008	30	27	31	29	29	29	40	30	34	32	34
2009	25	21	26	23	23	24	34	25	29	26	29
2010	25	20	26	23	23	24	36	25	30	27	30
2011	22	19	23	21	21	22	31	23	26	24	26
2012	23	19	24	21	21	22	32	23	27	24	27
2013	23	19	24	22	22	23	31	23	27	25	27
2014	23	20	24	22	22	23	31	23	27	25	27
2015	23	20	24	22	22	22	31	23	26	24	26
2016	22	18	23	20	21	21	30	22	25	23	25
2017	21	19	22	20	20	20	28	21	24	22	24

NOTES: Weighted percentages. See Appendix II, Family income.

SOURCE: NCHS, National Health Interview Survey. See Appendix I, National Health Interview Survey (NHIS).

Respondents who answered “don’t know” or refused to give a dollar amount for the total family income were asked a cascading sequence of income questions—a total of 15 cascading questions—that attempt to place the family income into 1 of 15 income intervals ranging from less than or equal to \$7,500 to greater than or equal to \$75,000. The initial question asks if the family income for the prior year was more or less than \$20,000. Subsequent sets of income range questions are asked so that each successive question establishes a narrower income range.

A family income variable is constructed from the total family income question and the cascading income questions. If an exact income is given, family income is set to this amount; otherwise it is set to the midpoint of the tightest bounds established by the cascading-income questions. The values of total family income are used to calculate an income-to-poverty ratio. For NIS, this ratio is calculated only for households with age-eligible children, using the either the actual family income value or the midpoint of the interval from the series of cascading questions in the numerator and the

poverty threshold provided by the U.S. Census Bureau for the size of the family and the number of related children in the household in the denominator. Details of the income questions and computation of the income-to-poverty ratio for each data collection year can be found in the NIS data documentation (Data User’s Guide and Household Interview Questionnaire for NIS–Child and NIS–Teen), available from: <https://www.cdc.gov/vaccines/imz-managers/nis/data-tables.html>.

For more information, see: Battaglia MP, Hoaglin DC, Izrael D, Khare M, Mokdad A. Improving income imputation by using partial income information and ecological variables. In: 2002 Proceedings of the American Statistical Association, Survey Research Methods Section. New York, NY. Available from: [https://www.cdc.gov/nchs/data/nis/estimation\\_weighting/Battaglia2002.pdf](https://www.cdc.gov/nchs/data/nis/estimation_weighting/Battaglia2002.pdf).

**Fee-for-service health insurance**—Private (commercial) health insurance that reimburses health care providers on the basis of a fee for each health service provided to the insured person. In addition, “fee-for-service” is a term often applied to original Medicare, to distinguish it from Medicare managed-care plans and other new payment systems. (Also

see [Appendix II](#), Health insurance coverage; Managed care; Medicare.)

**Fertility rate**—See [Appendix II](#), Rate: Birth and related rates.

**Functional limitation**—Functional limitation is based on six questions asked of persons aged 18 and over in the National Health Interview Survey (NHIS):

- Do you have difficulty seeing, even when wearing glasses?
- Do you have difficulty hearing, even when using your hearing aid(s)?
- Do you have difficulty walking or climbing steps?
- Using your usual language, do you have difficulty communicating, for example, understanding or being understood?
- Do you have difficulty remembering or concentrating?
- Do you have difficulty with self-care, such as washing all over or dressing?

The response categories are: no difficulty, some difficulty, a lot of difficulty, and cannot do at all/unable to do. These questions have been asked annually in NHIS starting in 2010 and are found in the 2010 Quality of Life NHIS files and the 2011–2017 Functioning and Disability NHIS files. Respondents with answers to one or more of the six questions were classified into one of three mutually exclusive categories. Those responding “a lot of difficulty” or “cannot do at all/unable to do” to at least one question were classified in the “a lot of difficulty/cannot do” category. Of the remaining, those responding “some difficulty” to at least one question were classified in the “some difficulty” category. Of the remaining, those responding “no difficulty” to at least one question were classified in the “no difficulty” category. During 2010–2017, 1% to 8% of respondents were excluded from the analysis because they were missing data across all six functioning questions. Data are for the civilian noninstitutionalized population. For more information on functional limitation, see <http://www.washingtongroup-disability.com/>.

Beginning with *Health, United States, 2017*, this measure of functional limitation replaced the disability measure used in prior editions of *Health, United States*. While both measures assess difficulty in several areas of functioning, they are not comparable.

For more information about NHIS, including annual questionnaire and documentation for these files, see <https://www.cdc.gov/nchs/nhis/data-questionnaires-documentation.htm>.

**General hospital**—See [Appendix II](#), Hospital.

**Geographic region**—The U.S. Census Bureau groups the 50 states and the District of Columbia, for statistical purposes, into four geographic regions (Northeast, Midwest, South, and West) and nine divisions based on geographic proximity; see [Appendix II](#), [Figure](#).

**Gestation**—In 2014, the National Vital Statistics System introduced a new definition of the period of gestation based on the obstetric estimate of gestation at delivery (OE). This method replaces the previous measure of gestation which was based on the date of the last normal menses (LMP). Data on LMP gestational age are subject to error for several reasons, including imperfect maternal recall or misidentification of the last menstrual period because of postconception bleeding, delayed ovulation, or intervening early miscarriage.

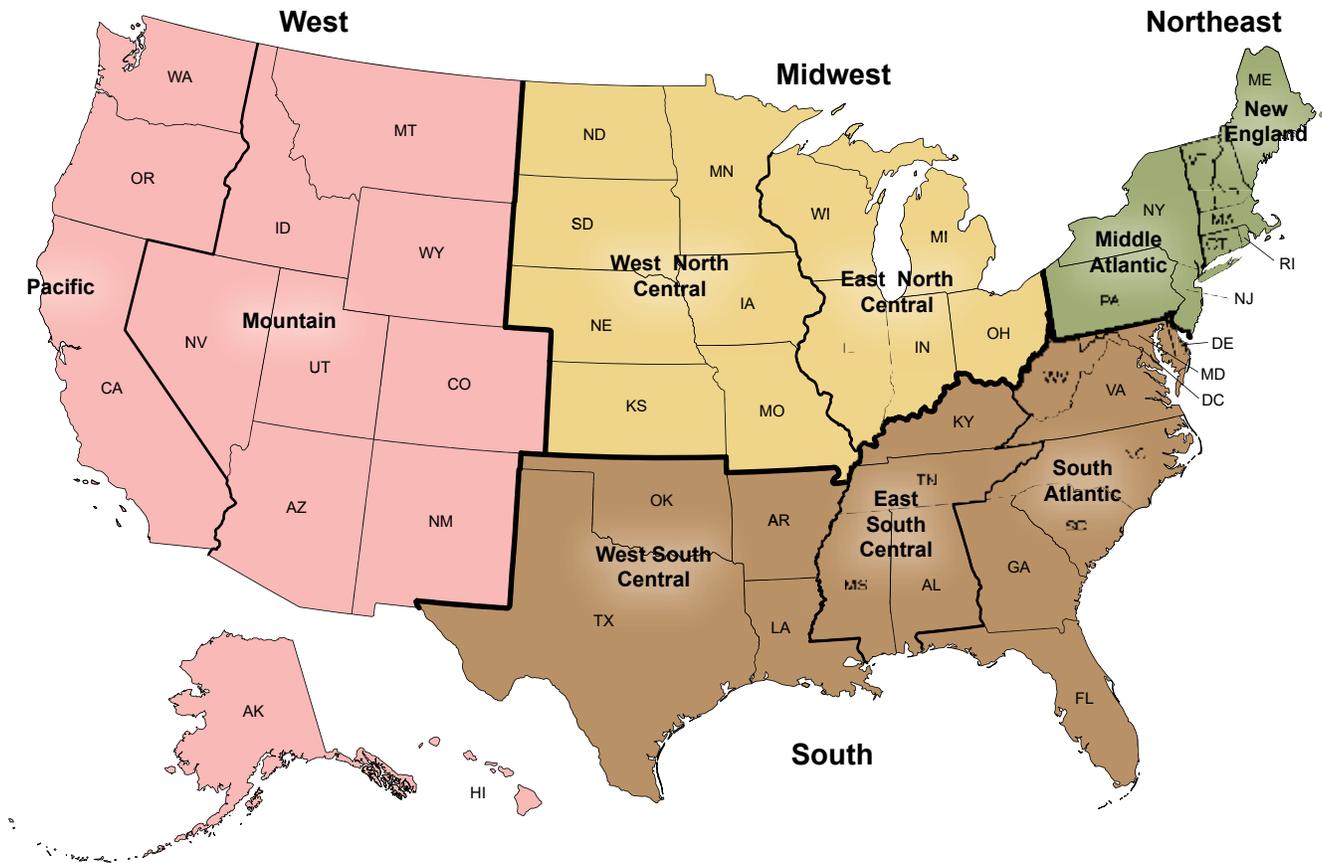
**Gross domestic product (GDP)**—The market value of the goods and services produced by labor and property located in the United States. As long as the labor and property are located in the United States, the suppliers (i.e., the workers, and for property, the owners) may be U.S. residents or residents of other countries. (Also see [Appendix II](#), Consumer Price Index [CPI]; Health expenditures, national.)

**Health care visit**—Starting with the 1997 National Health Interview Survey, respondents to the Sample Adult and Sample Child questionnaires (a knowledgeable adult, usually a parent) were asked about visits with doctors and other health care professionals using the following series of questions:

- “During the past 12 months, how many times [have you]/[has person] gone to a hospital emergency room about [your]/[his or her] own health? (This includes emergency room visits that resulted in a hospital admission.)”;
- “During the past 12 months, did [you]/[person] receive care at home from a nurse or other health care professional?” and “What was the total number of home visits received?”;
- “During the past 12 months, how many times [have you]/[has person] seen a doctor or other health care professional about [your]/[his or her] own health at a doctor’s office, a clinic, or some other place? Do not include times [you were]/[person was] hospitalized overnight, visits to hospital emergency rooms, home visits, or telephone calls.” Starting with the 2000 survey year, this question was amended to specifically exclude dental visits.

For 1997–1999, for each question, respondents were shown a flash card with response categories of 0, 1, 2–3, 4–9, 10–12, or 13 or more visits. For tabulation of the 1997–1999 data, responses of 2–3 were recoded to 2, responses of 4–9 were recoded to 6, responses of 10–12 were recoded to 11, and 13 or more visits were recoded to 13. The recoded values for the three types of visits were then added to yield an estimate of total health care visits. Starting with the 2000 survey year, response categories were expanded to 0, 1, 2–3, 4–5, 6–7, 8–9, 10–12, 13–15, or 16 or more. For 2000 and more recent data, these response categories were recoded to the midpoint of the range. The category of 16 or more was recoded to 16. The recoded values for the three types of visits were then added to yield an estimate of the summary measure of health care visits (including doctor’s

**Figure. U.S. Census Bureau: Four geographic regions and nine divisions of the United States**



SOURCE: U.S. Census Bureau

visits, hospital emergency room visits, and home visits). After summing the three component visit variables, respondents with values on the edge of the categories presented in *Health, United States* were rounded down to provide a more conservative estimate of the number of visits. For example, a respondent with 3.5 health care visits was included in the 1–3 visits category, and a respondent with 9.5 health care visits was included in the 4–9 visits category. Respondents were included in this analysis only if they were known on all three visit variables. (Also see [Appendix II](#), Emergency department or emergency room visit; Home visit.)

**Health expenditures, national**—Estimates from the Centers for Medicare & Medicaid Services (CMS) that measure calendar year spending for health care in the United States by type of service delivered (e.g., hospital care, physician services, nursing home care) and source of funding for those services (e.g., private health insurance, Medicare, Medicaid, out-of-pocket spending). CMS produces both historical and projected estimates of health expenditures by category. (Also see [Appendix I](#), National Health Expenditure Accounts [NHEA]; [Appendix II](#), Gross domestic product [GDP].) Types of national health expenditures are described below.

*Business, household, and other private expenditures*—Outlays for services paid for by nongovernmental sources, such as consumers, private industry, and philanthropic and other nonpatient-care sources.

*Government expenditures*—Outlays for services paid for by federal, state, and local government agencies or expenditures required by governmental mandate (such as workers’ compensation insurance payments).

*Health consumption expenditures*—Outlays for goods and services relating directly to patient care, plus expenses for administering health insurance programs, the net cost of health insurance, and public health activities. This category is equivalent to total national health expenditures minus expenditures for investment in noncommercial research, as well as expenditures by health care establishments on structures and equipment.

*Personal health care expenditures*—Outlays for goods and services relating directly to patient care. These expenditures are total national health expenditures minus expenditures for investment, health insurance program administration and the net cost of insurance, and public health activities.

**Health insurance coverage**—Broadly defined to include both public and private payers that cover medical expenditures incurred by a defined population in a variety of settings. Estimates of health insurance are available from several different government surveys. Because of differences in methodology, question wording, and recall period, estimates from different sources may vary and are not directly comparable. For more information, see: “Health Insurance Measurement and Estimates,” available from: <https://www.census.gov/content/dam/Census/library/working-papers/2015/demo/2015-Vornovitsy-Day-01.pdf>.

*National Health Interview Survey (NHIS)*—For point-in-time health insurance estimates, NHIS respondents were asked about their coverage at the time of interview. For 1993–1996, respondents were asked about their coverage in the previous month. Questions on health insurance coverage were expanded starting in 1993, compared with previous years. In 1997, the entire questionnaire was redesigned and data were collected using a computer-assisted personal interview. In 2007, questions on health insurance coverage were expanded again to include three new questions on high-deductible health plans, health savings accounts, and flexible spending accounts.

Respondents were considered to be covered by private health insurance if they indicated private health insurance or, prior to 1997, if they were covered by a single-service hospital plan. Private health insurance includes managed care such as health maintenance organizations.

Private insurance obtained through the workplace was defined as any private insurance that was originally obtained through a present or former employer or union or, starting in 1997, through the workplace, self-employment, or a professional association. Starting in 2011, respondents were also asked whether health insurance coverage was obtained through parents or another relative. Starting in 2014, an additional question on the Health Insurance Marketplace was added to the questionnaire for those respondents who did not indicate that their health plan was obtained through a present or former employer, union, self-employment, or professional association to evaluate whether their plan was obtained through the Health Insurance Marketplace or state-based exchange. Starting in 2015, an additional category “Through Healthcare.gov” was added to the list describing an additional option for the direct purchase of health insurance. Individuals who selected this new category did not receive the additional question about the Health Insurance Marketplace.

Until 1996, persons were defined as having Medicaid or other public assistance coverage if they indicated that they had either Medicaid or other public assistance or if they reported receiving Aid to Families with Dependent Children (AFDC) or Supplemental Security Income (SSI). After welfare reform in late 1996, Medicaid was

delinked from AFDC and SSI. Starting in 1997, persons were considered to be covered by Medicaid if they reported Medicaid or a state-sponsored health program. Starting in 1999, persons also were considered covered by Medicaid if they reported coverage by the Children’s Health Insurance Program. Medicare or military health plan coverage was also determined in the interview, and starting in 1997, other government-sponsored program coverage was determined as well.

If respondents did not report coverage under one of the types of plans listed above and either did not know or refused to provide information about their coverage type, they were considered to have unknown coverage.

The remaining respondents who reported no coverage under any of the types of plans listed were considered uninsured. The uninsured were persons who did not have coverage under private health insurance, Medicare, Medicaid, public assistance, a state-sponsored health plan, other government-sponsored programs, or a military health plan. Persons with only Indian Health Service (IHS) coverage were considered uninsured. Although NHIS respondents who report IHS coverage as their only source of coverage are currently recoded to being uninsured, IHS provides a comprehensive health service delivery system for approximately 2.2 million American Indian or Alaska Native persons; see: <https://www.ihs.gov/newsroom/factsheets/ihsprofile/>. Estimates of the percentage of persons who were uninsured based on NHIS may differ slightly from those based on other sources because of differences in survey questions, recall period, and other aspects of survey methodology.

In NHIS, on average less than 1% of people aged 65 and over reported no current health insurance coverage, but the small sample size precludes the presentation of separate estimates for this population. Therefore, the term “uninsured” refers only to the population under age 65.

Two additional questions were added to the health insurance section of NHIS beginning with the third quarter of 2004 (Table VIII). One question was asked of persons aged 65 and over who had not indicated that they had Medicare: “People covered by Medicare have a card which looks like this. [Are/Is] [person] covered by Medicare?” The other question was asked of persons under age 65 who had not indicated any type of coverage: “There is a program called Medicaid that pays for health care for persons in need. In this state it is also called [state name]. [Are/Is] [person] covered by Medicaid?” Respondents who originally classified themselves as uninsured, but whose classification was changed to Medicare or Medicaid on the basis of a “yes” response to either question, subsequently received appropriate follow-up questions concerning periods of noncoverage for insured respondents. Of the 892 people (unweighted) who were eligible to receive

**Table VIII. Percentage of persons under age 65 with Medicaid or who are uninsured, by selected demographic characteristics, using Method 1 and Method 2 estimation procedures: United States, 2004**

Characteristic	Medicaid <sup>1</sup>		Uninsured <sup>2</sup>	
	Method <sup>2,3</sup>	Method <sup>1,3</sup>	Method <sup>2,3</sup>	Method <sup>1,3</sup>
Age (years)	Percent (Standard error)			
Under 65	12.0 (0.24)	11.8 (0.24)	16.4 (0.23)	16.6 (0.23)
18–64	6.6 (0.17)	6.5 (0.17)	19.3 (0.26)	19.4 (0.26)
Under 18	25.4 (0.49)	24.9 (0.49)	9.2 (0.30)	9.7 (0.29)
Percent of poverty level <sup>4</sup>				
Below 100%	47.5 (1.03)	46.6 (1.03)	29.6 (0.89)	30.5 (0.92)
100% to less than 200%	22.0 (0.59)	21.5 (0.60)	28.9 (0.66)	29.4 (0.66)
200% or more	2.9 (0.13)	2.8 (0.13)	9.4 (0.23)	9.5 (0.23)
Age and percent of poverty level <sup>4</sup>				
Under 18:				
Below 100%	71.9 (1.35)	70.2 (1.35)	14.5 (1.15)	16.2 (1.22)
100% to less than 200%	39.2 (1.13)	38.4 (1.14)	15.0 (0.81)	15.8 (0.82)
200% or more	6.2 (0.33)	6.1 (0.33)	4.9 (0.30)	4.9 (0.30)
18–64:				
Below 100%	31.2 (1.02)	30.8 (1.02)	39.7 (1.09)	40.1 (1.09)
100% to less than 200%	12.0 (0.48)	11.8 (0.48)	37.0 (0.72)	37.2 (0.72)
200% or more	1.7 (0.11)	1.7 (0.10)	11.0 (0.26)	11.1 (0.26)
Hispanic origin and race <sup>5</sup>				
Hispanic or Latino	22.2 (0.55)	21.5 (0.55)	34.4 (0.64)	35.1 (0.65)
Mexican	22.0 (0.63)	21.5 (0.63)	37.6 (0.82)	38.1 (0.83)
Not Hispanic or Latino	10.2 (0.25)	10.1 (0.25)	13.2 (0.23)	13.3 (0.23)
White only	7.4 (0.26)	7.4 (0.26)	12.0 (0.25)	12.1 (0.25)
Black or African American only	23.9 (0.80)	23.5 (0.79)	17.3 (0.58)	17.8 (0.58)

<sup>1</sup>Includes persons who do not have private coverage but who have Medicaid or other state-sponsored health plans, including the Children’s Health Insurance Program (CHIP). See [Appendix II](#), Children’s Health Insurance Program.

<sup>2</sup>Includes persons who have not indicated that they are covered at the time of interview under private health insurance, Medicare, Medicaid, CHIP, a state-sponsored health plan, other government programs, or military health plan (includes VA, TRICARE, and CHAMP–VA). This category includes persons who are only covered by Indian Health Service (IHS) or only have a plan that pays for one type of service, such as accidents or dental care. See [Appendix II](#), Health insurance coverage.

<sup>3</sup>Starting with the third quarter of 2004, two additional questions were added to the National Health Interview Survey (NHIS) insurance section to reduce potential errors in reporting of Medicare and Medicaid status. Persons aged 65 and over not reporting Medicare coverage were asked explicitly about Medicare coverage, and persons under age 65 with no reported coverage were asked explicitly about Medicaid coverage. Estimates calculated without using the additional information from these questions are noted as Method 1. Estimates calculated using the additional information from these questions are noted as Method 2. See [Appendix II](#), Medicaid; Medicare.

<sup>4</sup>Based on family income and family size and composition, using the U.S. Census Bureau’s poverty thresholds. The percentage of respondents with unknown poverty level was 28.2% in 2004. See the NHIS survey description for 2004. Available from: <https://www.cdc.gov/nchs/data/nhis/srvydesc.pdf>.

<sup>5</sup>Persons of Hispanic origin may be of any race or combination of races. Similarly, the category Not Hispanic or Latino refers to all persons who are not of Hispanic or Latino origin, regardless of race.

SOURCE: NCHS, National Health Interview Survey, 2004, Family Core Component. Data are based on household interviews of a sample of the civilian noninstitutionalized population. For more information, see: Cohen RA, Martinez ME. Impact of Medicare and Medicaid probe questions on health insurance estimates from the National Health Interview Survey, 2004. National Center for Health Statistics. Health E-Stats 2005. Available from: <https://www.cdc.gov/nchs/data/hestat/impact04/impact04.htm>. See [Appendix I](#), National Health Interview Survey (NHIS).

the Medicare probe question in the third and fourth quarters of 2004, 55% indicated that they were covered by Medicare. Of the 9,146 people (unweighted) who were eligible to receive the Medicaid probe question in the third and fourth quarters of 2004, 3% indicated that they were covered by Medicaid. From 2004 onwards, estimates in *Health, United States* were calculated using the responses to the two additional probe questions. For a complete discussion of the effect of the addition of these two probe questions on the estimates for insurance coverage, see: Cohen RA, Martinez ME. Impact of Medicare and Medicaid probe questions on health insurance estimates from the National Health Interview Survey, 2004. Health E-Stats. National Center for Health

Statistics. 2005. Available from: <https://www.cdc.gov/nchs/data/hestat/impact04/impact04.htm>.

Survey respondents may be covered by health insurance at the time of interview but may have experienced one or more lapses in coverage during the 12 months prior to interview. Starting with *Health, United States, 2006*, NHIS estimates have been presented for the following three exhaustive categories: (a) people with health insurance continuously for the full 12 months prior to interview, (b) those who had a period of up to 12 months prior to interview without coverage, and (c) those who were uninsured for more than 12 months prior to interview. This stub variable has been added to selected tables. Two additional NHIS questions were

used to determine the appropriate category for the survey respondents: (a) all persons without a known comprehensive health insurance plan were asked, “About how long has it been since [person] last had health care coverage?”; and (b) all persons with known health insurance coverage were asked, “In the past 12 months, was there any time when [person] did NOT have ANY health insurance coverage?” Persons uninsured for 1 year are classified into the category “uninsured for a period of up to 12 months prior to interview.”

For more information, see: Section V. Health insurance section (FHI). In: 2017 National Health Interview Survey (NHIS) public use data release: Survey description. 2018. Available from: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/NHIS/2017/srvydesc.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2017/srvydesc.pdf). (Also see [Appendix II](#), Children’s Health Insurance Program [CHIP]; Fee-for-service health insurance; Health maintenance organization [HMO]; Managed care; Medicaid; Medicare; Uninsured.)

**Health maintenance organization (HMO)**—A health care system that assumes or shares both the financial risks and the delivery risks associated with providing comprehensive medical services to a voluntarily enrolled population in a particular geographic area, usually in return for a fixed, prepaid fee. Pure HMO enrollees use only the prepaid, capitated health services of the HMO panel of medical care providers. Open-ended HMO enrollees use the prepaid HMO health services but may also receive medical care from providers who are not part of the HMO panel. There is usually a substantial deductible, copayment, or coinsurance associated with use of nonpanel providers. HMO model types are described below.

*Group model HMO*—An HMO that contracts with a single multispecialty medical group to provide care to the HMO’s membership. The group practice may work exclusively with the HMO, or it may provide services to non-HMO patients as well. The HMO pays the medical group a negotiated per capita rate, which the group distributes among its physicians, usually on a salaried basis.

*Individual practice association (IPA)*—A health care provider organization comprised of a group of independent practicing physicians who maintain their own offices and band together for the purpose of contracting their services to HMOs, preferred provider organizations, and insurance companies. An IPA may contract with and provide services to both HMO and non-HMO plan participants.

*Mixed model HMO*—An HMO that combines features of more than one HMO model.

*Network model HMO*—An HMO that contracts with multiple physician groups to provide services to HMO members. It may include single or multispecialty groups.

*Staff model HMO*—A closed-panel HMO (where patients can receive services only through a limited number of

providers) in which physicians are HMO employees. The providers see members in the HMO’s own facilities. (Also see [Appendix II](#), Managed care; Preferred provider organization [PPO].)

**Health status, respondent-assessed**—Health status was measured in the National Health Interview Survey by asking the family respondent about his or her health or the health of a family member: “Would you say [person’s] health in general is excellent, very good, good, fair, or poor?”

**Hispanic origin**—Hispanic or Latino origin includes persons of Mexican, Puerto Rican, Cuban, Central and South American, and other or unknown Latin American or Spanish origin. Persons of Hispanic origin may be of any race.

*Birth file*—The reporting area for a Hispanic-origin item on the birth certificate expanded between 1980 and 1993 (when the Hispanic item was included on the birth certificate in all states and the District of Columbia [D.C.]). Trend data on births for Hispanic and non-Hispanic mothers in *Health, United States* are affected by expansion of the reporting areas, which affects numbers of events, composition of the Hispanic population, and maternal and infant health characteristics.

In 1980 and 1981, information on births for Hispanic mothers was reported on the birth certificate by the following 22 states: Arizona, Arkansas, California, Colorado, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Maine, Mississippi, Nebraska, Nevada, New Jersey, New Mexico, New York, North Dakota, Ohio, Texas, Utah, and Wyoming. In 1982 Tennessee, and in 1983 D.C., began reporting this information. Between 1983 and 1987, information on births for Hispanic mothers was available for 23 states and D.C. In 1988, this information became available for Alabama, Connecticut, Kentucky, Massachusetts, Montana, North Carolina, and Washington State, increasing the number of states reporting information on births for Hispanic mothers to 30 states and D.C. In 1989, this information became available from an additional 17 states, increasing the number of Hispanic-reporting states to 47 and D.C. In 1989, only Louisiana, New Hampshire, and Oklahoma did not report Hispanic origin of mother on the birth certificate. With the inclusion of Louisiana and Oklahoma in 1990 as Hispanic-reporting states, 99% of birth records included information on mother’s origin. Hispanic origin of the mother was reported on the birth certificates of 49 states and D.C. in 1991 and 1992; only New Hampshire did not provide this information. Starting in 1993, Hispanic origin of mother was reported by all 50 states and D.C.

Starting with 2003 data, some states began using the 2003 revision of the U.S. Standard Certificate of Live Birth. As of January 1, 2016, all states, D.C., Guam, Puerto Rico, the U.S. Virgin Islands, and the Northern Marianas had implemented the revised birth certificate of 2003. Hispanic origin and race are collected separately on the birth certificate. The

Hispanic-origin question on the 2003 revision of the birth certificate asks respondents to select only one response. Occasionally, more than one Hispanic-origin response is given; that is, a specified Hispanic-origin group (Mexican, Puerto Rican, Cuban, or Central and South American) in combination with one or more other specified Hispanic-origin groups. From 2003 through 2012, respondents who selected more than one Hispanic origin on the birth certificate were classified as other Hispanic. In 2012, 0.4% of births in the revised state-reporting area, plus Massachusetts (unrevised state that also reported more than one Hispanic-origin response), were to women reporting more than one Hispanic origin. Beginning with 2013 data, respondents who select more than one Hispanic origin are randomly assigned to a single Hispanic origin. The number of births to “other and unknown Hispanic” women increased by 1.0% from 145,381 in 2016 to 146,849 in 2017, increasing steadily from 48,972 in 2003. Factors that may have influenced this rise are not clear but may include less specificity in respondent reporting of Hispanic origin and increases in the populations of groups included in the “other Hispanic” category. The Hispanic-origin question on the 1989 revision of the birth certificate also offers the opportunity to report more than one origin; however, National Center for Health Statistics (NCHS) processing guidelines for unrevised data allow for coding only the first Hispanic origin listed.

*Linked birth/infant death file*—Particularly useful for computing accurate infant mortality rates by race and Hispanic origin because the race and Hispanic origin of the mother from the birth certificate are used in both the numerator and denominator of the linked birth/infant death infant mortality rate. In contrast, infant mortality rates based on the vital statistics mortality file use race and Hispanic origin as reported on the death certificate for the numerator and race and Hispanic origin of the mother as reported on the birth certificate for the denominator. Race and Hispanic-origin information from the birth certificate, which is reported by the mother, is considered more reliable than race and Hispanic-origin information from the death certificate, which is reported by the funeral director based on information provided by an informant or by observation. See “Birth file” and “Mortality file” in this section.

*Mortality file*—The reporting area for a Hispanic-origin item on the death certificate expanded between 1985 and 1997. In 1985, mortality data by Hispanic origin of decedent were based on deaths of residents in the following 17 states and D.C., whose data on the death certificate were at least 90% complete on a place-of-occurrence basis and of comparable format: Arizona, Arkansas, California, Colorado, Georgia, Hawaii, Illinois, Indiana, Kansas, Mississippi, Nebraska, New York, North Dakota, Ohio, Texas, Utah, and Wyoming. In 1986, New Jersey began reporting Hispanic origin of decedent, increasing the number of reporting states

to 18 and D.C. in 1986 and 1987. In 1988, Alabama, Kentucky, Maine, Montana, North Carolina, Oregon, Rhode Island, and Washington State were added to the reporting area, increasing the number of states to 26 and D.C. In 1989, an additional 18 states were added, increasing the Hispanic-reporting area to 44 states and D.C.; only Connecticut, Louisiana, Maryland, New Hampshire, Oklahoma, and Virginia were not included in the reporting area. Starting with 1990 data in *Health, United States*, the criterion was changed to include states whose data were at least 80% complete. As a result, there was an increase in the reporting area for Hispanic origin of decedent to 47 states and D.C. in 1990 (Maryland, Virginia, and Connecticut were added); 48 states and D.C. in 1991 (Louisiana was added); and 49 states and D.C. in 1993–1996 (New Hampshire was added). Only Oklahoma did not provide this information in 1993–1996. Starting in 1997, Hispanic origin of decedent was reported by all 50 states and D.C. Based on data from the U.S. Census Bureau, the 1990 reporting area encompassed 99.6% of the U.S. Hispanic population. In 1990, more than 96% of death records included information on Hispanic origin of the decedent.

Starting with 2003 data, some states began using the 2003 revision of the U.S. Standard Certificate of Death, which allows the reporting of more than one race (multiple races) and includes some revisions in the item reporting Hispanic origin. The effect of the 2003 revision of the Hispanic-origin item on the reporting of Hispanic origin on death certificates is presumed to be minor. For more information, see [Appendix II](#), Race. Also see the Technical Notes sections of the annual series of “Deaths: Final Data” reports, available from: <https://www.cdc.gov/nchs/products/nvsr.htm>; and “NCHS Procedures for Multiple-Race and Hispanic Origin Data: Collection, Coding, Editing, and Transmitting,” available from: [https://www.cdc.gov/nchs/data/dvs/Multiple\\_race\\_documentation\\_5-10-04.pdf](https://www.cdc.gov/nchs/data/dvs/Multiple_race_documentation_5-10-04.pdf).

*National Health and Nutrition Examination Survey (NHANES)*—Questions on Hispanic origin have been self-reported in NHANES III and subsequent years of NHANES. Questions on Hispanic origin precede questions on race. For 1999–2006 NHANES data, the NHANES sample was designed to provide estimates specifically for persons of Mexican origin and not for all Hispanic-origin persons in the United States. Persons of Hispanic origin other than Mexican were entered into the sample with different selection probabilities that are not nationally representative of the total U.S. Hispanic population. Starting with 2007–2008 data collection, all Hispanic persons were oversampled, not just persons of Mexican origin. In addition to allowing estimates for the total group of Hispanic persons, the sample size for Hispanic persons of Mexican origin is sufficient to continue to produce reliable estimates for this group. However, the methodology for the oversampling of Hispanic persons did not provide sufficient sample sizes

for calculating estimates for other Hispanic subgroups besides Mexican origin. For more information on the NHANES sampling methodology changes, see “National Health and Nutrition Examination Survey: Sample Design, 2011–2014,” available from: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_162.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_162.pdf); and the NHANES analytic guidelines available from: [https://www.cdc.gov/nchs/data/nhanes/analytic\\_guidelines\\_11\\_12.pdf](https://www.cdc.gov/nchs/data/nhanes/analytic_guidelines_11_12.pdf).

*National Health Interview Survey (NHIS)*—Data on Hispanic origin have been self-reported in NHIS since 1976, and in 1978, race and Hispanic origin were asked for the first time in a two-question format. Over time, there has been considerable variation in the placement and way that both the Hispanic origin and race questions have been asked. For information on race and Hispanic origin in NHIS, see the survey’s “Race and Hispanic Origin Information” page, available from: <https://www.cdc.gov/nchs/nhis/rhoi.htm>.

**HIV**—See [Appendix II](#), Human immunodeficiency virus (HIV) disease.

**Home visit**—Starting with the 1997 National Health Interview Survey, respondents to the Sample Adult and Sample Child questionnaires (a knowledgeable adult, usually a parent) were asked about home visits received during the 12 months prior to interview. Respondents were asked, “During the past 12 months, did [you]/[person] receive care at home from a nurse or other health care professional?” as well as “What was the total number of home visits received?” These data are combined with data on visits to doctors’ offices, clinics, and emergency departments to provide a summary measure of adult health care visits. (Also see [Appendix II](#), Emergency department or emergency room visit; Health care visits.)

**Hospital**—According to the American Hospital Association (AHA), hospitals are licensed institutions with at least six beds whose primary function is to provide diagnostic and therapeutic patient services for medical conditions; they have an organized physician staff and provide continuous nursing services under the supervision of registered nurses. The World Health Organization (WHO) considers an establishment to be a hospital if it is permanently staffed by at least one physician, can offer inpatient accommodation, and can provide active medical and nursing care. Hospitals may be classified by type of service, ownership, size in terms of number of beds, and length of stay. (Also see [Appendix II](#), Bed, health facility; Emergency department; Inpatient; Outpatient department.)

*Community hospital*—Based on the AHA definition, includes all nonfederal, short-term general and special hospitals whose facilities and services are available to the public. Special hospitals include obstetrics and gynecology; eye, ear, nose, and throat; rehabilitation; orthopedic; and other specialty services. Short-term general and special children’s hospitals are also

considered to be community hospitals. A hospital may include a nursing-home-type unit and still be classified as short-term, provided that the majority of its patients are admitted to units where the average length of stay is less than 30 days. Hospital units of institutions such as prisons and college infirmaries that are not open to the public and are contained within a nonhospital facility are not included in the category of community hospitals. Traditionally, the definition has included all nonfederal short-stay hospitals except facilities for persons with intellectual disabilities (formerly called mentally retarded). In a revised definition, the following additional sites were excluded: hospital units of institutions, and alcohol use disorder and chemical dependency facilities.

*Federal hospital*—Those operated by the federal government.

*For-profit hospital*—Those operated for profit by individuals, partnerships, or corporations.

*General hospital*—Those providing diagnostic, treatment, and surgical services for patients with a variety of medical conditions. According to WHO, these hospitals provide medical and nursing care for more than one category of medical discipline (e.g., general medicine, specialized medicine, general surgery, specialized surgery, and obstetrics). Excluded are hospitals, usually in rural areas, that provide a more limited range of care.

*Nonprofit hospital*—Those controlled by nonprofit organizations, such as religious organizations and fraternal societies.

*Registered hospital*—Those registered with AHA. About 98% of U.S. hospitals are registered.

*Short-stay hospital*—In the National Health Interview Survey, short-stay hospitals are defined as any hospital or hospital department in which the type of service provided is general; maternity; eye, ear, nose, and throat; children’s; or osteopathic.

*Special hospital*—Those that provide a particular type of service to the majority of their patients. Special hospitals include psychiatric, tuberculosis, chronic disease, rehabilitation, maternity, and alcohol or narcotic dependency facilities.

**Hospital utilization**—Estimates of hospital utilization (such as percentage of the population with a hospitalization) presented in *Health, United States* are based on data from the National Health Interview Survey (NHIS). NHIS hospital utilization data are based on household interviews with a sample of the civilian noninstitutionalized population. NHIS respondents were asked whether they had any overnight hospital stays in the past year, excluding overnight stays in the emergency room. (Also see [Appendix I](#), National [Nationwide] Inpatient Sample; National Health Interview Survey [NHIS].)

**Human immunodeficiency virus (HIV) disease**—Caused by infection with a cytopathic retrovirus, which in turn leads to destruction of parts of the immune system. A surveillance case for HIV requires laboratory-confirmed evidence of infection, including a positive result on a screening test for HIV antibody, followed by a positive result on a confirmatory test, or a positive result or detectable quantity on an HIV virologic test (see: Centers for Disease Control and Prevention [CDC]. HIV surveillance report, 2017. vol 29. 2018. Available from: <https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2017-vol-29.pdf>).

Since 1985, many states and U.S. dependent areas have implemented HIV case reporting as part of their comprehensive HIV and AIDS surveillance programs. As of April 2008, all reporting areas (50 states, the District of Columbia, and the 6 U.S.-dependent areas of American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, the Republic of Palau, and the U.S. Virgin Islands) had implemented HIV case surveillance using a confidential system for name-based case reporting for both HIV infection and AIDS. To better capture and characterize populations in which HIV infection has been newly diagnosed, including persons with evidence of recent HIV infection, many states report the prevalence of those living with a diagnosis of HIV infection, including those living with AIDS.

In 2008, changes were made to the case definition for HIV infection. The new case definition combined the two previous case definitions for HIV and AIDS and established a new disease staging classification. The term “HIV/AIDS” was replaced with the term “diagnosis of HIV infection,” which is defined as diagnosis of HIV infection regardless of the stage of disease (stage 1, 2, 3 [AIDS], or unknown) and refers to all persons with a diagnosis of HIV infection (see Schneider E, Whitmore S, Glynn M, Dominguez K, Mitsch A, McKenna M. Revised Surveillance Case Definitions for HIV Infection Among Adults, Adolescents, and Children Aged <18 Months and for HIV Infection and AIDS Among Children Aged 18 Months to <13 Years—United States, 2008. *MMWR Morb Mortal Wkly Rep* 57(10):1–8. 2008. Available from: <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5710a1.htm>).

The 2008 case definition was used to classify cases diagnosed from the beginning of the epidemic through 2013. In order to classify HIV infection among both adults and adolescents, the following HIV infection classification staging system was used:

- *HIV infection, stage 1:* No AIDS-defining condition and either a CD4 count of 500 cells/μL or more or a CD4 percentage of total lymphocytes of 29% or more.
- *HIV infection, stage 2:* No AIDS-defining condition and either a CD4 count of 200–499 cells/μL or a CD4 percentage of total lymphocytes of 14% to 28%.
- *HIV infection, stage 3 (AIDS):* Documentation of an AIDS-defining condition, or either a CD4 count of less than 200 cells/μL or a CD4 percentage of total lymphocytes of less than 14%; documentation of an AIDS-defining condition supersedes a CD4 count or percentage that would not by itself be the basis for a stage 3 (AIDS) classification.

- *HIV infection, stage unknown:* No reported information on AIDS-defining conditions and no information available on CD4 count or percentage (see “Revised Surveillance Case Definitions for HIV Infection Among Adults, Adolescents, and Children Aged <18 Months and for HIV Infection and AIDS Among Children Aged 18 Months to <13 Years—United States, 2008”).

In 2014, the HIV surveillance case definition was updated to adapt to changes in diagnostic criteria used by laboratories and clinicians (see CDC “HIV Surveillance Report, 2014”). The 2014 case definition was used to classify cases diagnosed beginning in 2014 and is similar to the 2008 case definition except for the following: (a) inclusion of criteria for stage 0, (b) inclusion of CD4 testing criteria for stage 3 in children, and (c) changes in cutoffs for CD4 percentages of total lymphocytes used for classifications of stages 1 and 2 in persons aged 6 years and over. The 2014 case definition classifies HIV infection based on the following stages:

- *HIV infection, stage 0:* Negative (nonreactive) or indeterminate HIV-1 test result within 6 months before the first positive (reactive) HIV-1 test result, or a negative or an indeterminate HIV-1 antibody test result within 6 months before or after the first positive HIV-1 nucleic acid test result (if the latter was not the first positive HIV test). The stage remains stage 0 during the 6 months after the first positive test result; after 6 months, the stage is reclassified, depending upon CD4 lymphocyte test results (stage 1, 2, or 3), the diagnosis of an AIDS-defining opportunistic illness ([OI]; stage 3), or the absence of reported CD4 or OI information (stage unknown).
- *HIV infection, stages 1, 2, and 3:* Documentation of an AIDS-defining condition (excluding stage 0) is stage 3; otherwise, the stage is determined by the lowest CD4 test result.
- *HIV infection, stage unknown:* No reported information on AIDS-defining conditions and no information available on CD4 count or percentage.

*Mortality coding*—Starting with 1999 data and the introduction of the 10th revision of the *International Classification of Diseases* (ICD–10), the title for this cause of death was changed from HIV infection to HIV disease, and the ICD codes were changed to B20–B24. Starting with 1987 data, the National Center for Health Statistics introduced category numbers \*042–\*044 for classifying and coding HIV infection as a cause of death in ICD–9. The asterisks before the category numbers indicate that these codes were not part of the original ICD–9. HIV infection was formerly referred to as human T-cell lymphotropic virus-III/lymphadenopathy-associated virus (HTLV–III/LAV) infection. Before 1987, deaths involving HIV infection were classified to “Deficiency of cell-mediated immunity” (ICD–9 code 279.1) contained in the category “All other diseases”; to “Pneumocystosis” (ICD–9 code 136.3) contained in the category “All other infectious and parasitic diseases”; to

“Malignant neoplasms, including neoplasms of lymphatic and hematopoietic tissues”; and to a number of other causes. Because of these coding changes, death statistics for HIV infection before 1987 are not strictly comparable with data for 1987 and subsequent years, and therefore are not shown in *Health, United States*. (Also see [Appendix II](#), Acquired immunodeficiency syndrome [AIDS]; Cause of death; *International Classification of Diseases* [ICD]; *International Classification of Diseases, 9th Revision, Clinical Modification* [ICD–9–CM]; [Table IV](#).)

**Hypercholesterolemia**—See [Appendix II](#), Cholesterol.

**Hypertension**—In *Health, United States*, a participant is considered to have hypertension if they have measured high blood pressure or if they report currently taking a prescription medicine for high blood pressure. Measured high blood pressure is a systolic blood pressure of greater than or equal to 140 mm Hg or diastolic blood pressure of greater than or equal to 90 mm Hg. An average of up to three systolic and diastolic blood pressure readings were used for systolic and diastolic blood pressure values. For antihypertensive medication use, respondents were asked, “Are you now taking prescribed medicine for your high blood pressure?”

Uncontrolled high blood pressure is defined as having measured high blood pressure, among the subpopulation of those with hypertension. These blood pressure definitions are consistent with the National Heart, Lung, and Blood Institute’s (NHLBI) “Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure” (available from: <https://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.pdf>), and “An Effective Approach to High Blood Pressure Control: A Science Advisory From the American Heart Association, the American College of Cardiology, and the Centers for Disease Control and Prevention” (available from: <https://www.ahajournals.org/doi/full/10.1161/HYP.0000000000000003>).

In October 2017, a revised set of practice guidelines from the American College of Cardiology/American Heart Association Task Force was released. These guidelines set lower cutoff points for defining high blood pressure: average measured systolic blood pressure of greater than or equal to 130 mm Hg or diastolic pressure of greater than or equal to 80 mm Hg. These standards capture what NHLBI categorizes as “prehypertension”; however, they have not yet been adopted by NHLBI and other organizations. Therefore, *Health, United States* continues to use the current standards of systolic blood pressure of greater than or equal to 140 mm Hg or diastolic pressure of greater than or equal to 90 mm Hg for hypertension estimates. The impact of the lower blood pressure cutoff points on the percentage of the population that would be classified as having high blood pressure is shown in [Table VI](#). Among adults aged 20 and over, the age-adjusted prevalence of high blood pressure in 2013–2016 would be 14.9% under the current standards and 34.0% under the alternate standards. Applying the alternate standard to the age-adjusted prevalence of high blood pressure in 1999–2002 would change the percentage

from 19.9% to 42.9%. Substantial changes in the percentage with high blood pressure were observed among males and females, across racial and ethnic groups, and by age group ([Table VI](#)).

For more information on the alternate standards, see: Whelton PK, Carey RM, Aronow WS, Casey Jr DE, Collins KJ, Himmelfarb CD, et al., 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the prevention, detection, evaluation, and management of high blood pressure in adults. *J Am Coll Cardiol*. 2017. Available from: <https://www.ahajournals.org/doi/full/10.1161/HYP.0000000000000065>.

Blood pressure data presented in *Health, United States* are from the National Health and Nutrition Examination Survey (NHANES). Blood pressure is measured by averaging up to three blood pressure readings taken for an NHANES participant. Blood pressure readings of 0 mm Hg are not included in the estimates. The methods used to measure the blood pressure of participants have changed over the different NHANES survey years. Changes have included the following:

- Number of blood pressure measurements taken (increased from one to four)
- Equipment maintenance procedures
- Training of persons taking readings (physician, nurse, or interviewer)
- Proportion zero end-digits for systolic and diastolic readings
- Published diastolic definition
- Location where the measurements were taken (mobile examination center [MEC] or home)

In 1999 and subsequent years, blood pressure was measured for participants aged 8 years and over in the NHANES MEC by one of its physicians. Three consecutive blood pressure readings are obtained using the same arm. If a blood pressure measurement was interrupted or incomplete, a fourth attempt may be made. Both systolic and diastolic measurements are recorded to the nearest even number. Participants with any of the following on both arms were excluded from the examination: rashes, gauze dressings, casts, edema, paralysis, tubes, open sores or wounds, withered arms, a-v shunts, or radical mastectomy. Patients were also excluded if the blood pressure cuff did not fit on the arm.

In NHANES III, three sets of blood pressure measurements were taken in the MEC for examinees aged 5 years and over. Blood pressure measurements were also taken by trained interviewers during the household interview, on sample persons aged 17 and over. Systolic and diastolic average blood pressures were computed as the arithmetic mean of six or fewer measurements obtained at the household interview (maximum of three) and the MEC examination (maximum of three). If the examinee did not have blood pressure measurements taken in the MEC, this variable was calculated from measurements taken at the household interview. Both systolic and diastolic measurements were recorded to the nearest even number.

For more information on changes in blood pressure measurement in NHANES up to 1991, see: Burt VL, Cutler JA, Higgins M, Horan MJ, Labarthe D, Whelton P, et al. Trends in the prevalence, awareness, treatment, and control of hypertension in the adult U.S. population: Data from the health examination surveys, 1960 to 1991. *Hypertension* 26(1):60–9. 1995.

**ICD; ICD codes**—See [Appendix II](#), Cause of death; *International Classification of Diseases (ICD)*.

**Illicit drug use**—Refers to the use and misuse of illegal and controlled drugs.

*National Survey on Drug Use and Health (NSDUH)*—Information on illicit drug use is collected for survey participants aged 12 and over. Information on any illicit drug use includes any use of marijuana or hashish, cocaine, crack, heroin, hallucinogens, inhalants or methamphetamine, as well as misuse of prescription psychotherapeutic drugs. Prescription psychotherapeutics include pain relievers, tranquilizers, stimulants, and sedatives; over-the-counter drugs are excluded. Misuse of prescription psychotherapeutics is defined as use in any way not directed by a doctor. Such misuse may include obtaining the drug without a valid prescription, or using the prescribed drug in greater amounts, more often, longer than told or use in any other way not directed by a doctor. Current use (within the past 30 days) is based on the question: “How long has it been since you last used [drug name]?” This answer is cross-checked with the following question: “Think specifically about the past 30 days, from [DATE] up to and including today. During the past 30 days, on how many days did you use [drug name]?” Starting in 2013, information about marijuana use that was recommended by a doctor or other health care professional has been collected; however, reported marijuana use is classified as illicit drug use. Starting in 2015, the NSDUH questionnaire underwent a partial redesign, and changes in measurement for 7 of the 10 illicit drug categories— hallucinogens, inhalants, methamphetamine, and the misuse of prescription pain relievers, tranquilizers, stimulants, and sedatives—may have affected the comparability of the measurement of these illicit drugs and any illicit drug with earlier years (Also see [Appendix II](#), Substance use).

**Immunization**—See [Appendix II](#), Vaccination.

**Incidence**—The number of cases of disease having their onset during a prescribed period of time. It is often expressed as a rate (e.g., the incidence of measles per 1,000 children aged 5–15 years during a specified year). Measuring incidence may be complicated because the population at risk for the disease may change during the period of interest due to births, deaths, or migration, for example. In addition, determining whether a case is new—that is, whether its onset occurred during the prescribed period of time—may be difficult. Because of these difficulties in measuring incidence,

many health statistics are instead measured in terms of prevalence. (Also see [Appendix II](#), Prevalence.)

**Income**—See [Appendix II](#), Family income.

**Individual practice association (IPA)**—See [Appendix II](#), Health maintenance organization (HMO).

**Infant death**—The death of a live-born child before his or her first birthday. Age at death may be further classified as neonatal or postneonatal. Neonatal deaths are those that occur before the 28th day of life; postneonatal deaths are those that occur between 28 days and under 1 year of age. (Also see [Appendix II](#), Rate: Death and related rates.)

**Insurance**—See [Appendix II](#), Health insurance coverage.

**International Classification of Diseases (ICD)**—Used to code and classify cause-of-death data. ICD is developed collaboratively by the World Health Organization and 10 international centers, 1 of which is housed at the National Center for Health Statistics (NCHS). The purpose of ICD is to promote international comparability in the collection, classification, processing, and presentation of health statistics. Since 1900, ICD has been modified about once every 10 years, except for the 20-year interval between the 9th and 10th revisions (ICD–9 and ICD–10) ([Table III](#)). The purpose of the revisions is to stay abreast of advances in medical science. New revisions usually introduce major disruptions in time series of mortality statistics ([Tables IV and V](#)). For more information, see the NCHS ICD–10 website at: <https://www.cdc.gov/nchs/icd/icd10.htm>. (Also see [Appendix II](#), Cause of death; Comparability ratio; *International Classification of Diseases, 9th Revision, Clinical Modification [ICD–9–CM]*.)

**International Classification of Diseases, 9th Revision, Clinical Modification (ICD–9–CM)**—Based on, and compatible with, the World Health Organization’s ICD–9. The United States used ICD–9–CM to code morbidity diagnoses and inpatient procedures until October 1, 2015, when the *International Classification of Diseases, 10th Revision, Clinical Modification/Procedure Coding System (ICD–10–CM/PCS)* went into effect. ICD–9–CM consists of three volumes. Volumes 1 and 2 contain the diagnosis tabular list and index; Volume 3 contains the procedure classification (tabular list and index combined).

ICD–9–CM is divided into 17 chapters and 2 supplemental classifications. The chapters are arranged primarily by body system. In addition, there are chapters for Infectious and parasitic diseases; Neoplasms; Endocrine, nutritional, and metabolic diseases; Mental disorders; Complications of pregnancy, childbirth, and puerperium; Certain conditions originating in the perinatal period; Congenital anomalies; and Symptoms, signs, and ill-defined conditions. The two supplemental classifications are for factors influencing health status and contact with health services (V codes), and for external causes of injury and poisoning (E codes).

For more information about ICD–9–CM, see the National Center for Health Statistics “Classification of Diseases,

**Table IX. Current cigarette smoking among adults aged 18 and over, by race and Hispanic origin under the 1997 and 1977 Standards for federal data on race and ethnicity: United States, average annual 1993–1995**

1997 Standards	Sample size	Percent (standard error)	1977 Standards	Sample size	Percent (standard error)
White only . . . . .	46,228	25.2 (0.26)	White . . . . .	46,664	25.3 (0.26)
Black or African American only . . . . .	7,208	26.6 (0.64)	Black . . . . .	7,334	26.5 (0.63)
American Indian or Alaska Native only . . . . .	416	32.9 (2.53)	American Indian or Alaskan Native . . . . .	480	33.9 (2.38)
Asian only . . . . .	1,370	15.0 (1.19)	Asian or Pacific Islander . . . . .	1,411	15.5 (1.22)
Two or more races total . . . . .	786	34.5 (2.00)			
Black or African American; white . . . . .	83	*21.7 (6.05)			
American Indian or Alaska Native; white . . . . .	461	40.0 (2.58)			
Race, any mention					
White, any mention . . . . .	46,882	25.3 (0.26)			
Black or African American, any mention . . . . .	7,382	26.6 (0.63)			
American Indian or Alaska Native, any mention . . . . .	965	36.3 (1.71)			
Asian, any mention . . . . .	1,458	15.7 (1.20)			
Native Hawaiian or Other Pacific Islander, any mention . . . . .	53	*17.5 (5.10)			
Hispanic origin and race					
Not Hispanic or Latino			Not Hispanic		
White only . . . . .	42,421	25.8 (0.27)	White . . . . .	42,976	25.9 (0.27)
Black or African American only . . . . .	7,053	26.7 (0.65)	Black . . . . .	7,203	26.7 (0.64)
American Indian or Alaska Native only . . . . .	358	33.5 (2.69)	American Indian or Alaska Native . . . . .	407	35.4 (2.53)
Asian only . . . . .	1,320	14.8 (1.21)	Asian or Pacific Islander . . . . .	1,397	15.3 (1.24)
Two or more races total . . . . .	687	35.6 (2.15)			
Hispanic or Latino . . . . .	5,175	17.8 (0.65)	Hispanic . . . . .	5,175	17.8 (0.65)

\* Estimates are considered unreliable. Data preceded by an asterisk have a relative standard error of 20%–30%.

NOTES: The Office of Management and Budget’s (OMB) 1997 *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity* specify five race groups (white, black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander) and allows respondents to report one or more race groups. Estimates for single-race and multiple-race groups not shown above do not meet standards for statistical reliability or confidentiality (relative standard error greater than 30%). Race groups under the 1997 Standards were based on the question, “What is the group or groups which represents [person’s] race?” For persons who selected multiple groups, race groups under the OMB’s 1977 Race and Ethnic Standards for Federal Statistics and Administrative Reporting were based on the additional question, “Which of those groups would you say best represents [person’s] race?” Race-specific estimates in this table were calculated after excluding respondents of other and unknown race. Other published race-specific estimates are based on files in which such responses have been edited. Estimates are age-adjusted to the year 2000 standard population using five age groups: 18–24, 25–34, 35–44, 45–64, and 65 and over. See [Appendix II](#), Age adjustment.

SOURCE: NCHS, National Health Interview Survey. See [Appendix I](#), National Health Interview Survey (NHIS).

Functioning, and Disability” website at: <https://www.cdc.gov/nchs/icd.htm>. (Also see [Appendix II](#), *International Classification of Diseases* [ICD].)

**Late fetal death rate**—See [Appendix II](#), Rate: Death and related rates.

**Leading causes of death**—See [Appendix II](#), Cause-of-death ranking.

**Life expectancy**—The average number of years of life remaining to a person at a particular age and based on a given set of age-specific death rates—generally the mortality conditions existing in the period mentioned. Life expectancy may be determined by sex, race and Hispanic origin, or other characteristics, by using age-specific death rates for the population with that characteristic. (Also see [Appendix II](#), Rate: Death and related rates.)

U.S. life tables by Hispanic origin were available starting

with 2006 data. Life expectancy data for the Hispanic population were not available before 2006 for three major reasons: (a) coverage of the Hispanic population in the United States mortality statistics system was incomplete, (b) misclassification of Hispanic persons on death certificate data underestimated deaths in the Hispanic population, and (c) misstatement of age at the oldest ages in the Hispanic population led to an underestimation of mortality at the oldest ages.

Hispanic origin was added to the United States standard death certificate in 1989, but it was not adopted by every state until 1997. By 1997, all states had reporting rates over 99%. Research on race and Hispanic-origin reporting on U.S. death certificates found that misclassification of race and Hispanic origin accounts for a net underestimate of 5% for total Hispanic deaths, 1% for total non-Hispanic black deaths, and 0.5% for non-Hispanic white deaths. To address the effects of age misstatement at the oldest ages,

**Table X. Private health care coverage among persons under age 65, by race and Hispanic origin under the 1997 and 1977 Standards for federal data on race and ethnicity: United States, average annual 1993–1995**

1997 Standards	Sample size	Percent (standard error)	1977 Standards	Sample size	Percent (standard error)
White only . . . . .	168,256	76.1 (0.28)	White . . . . .	170,472	75.9 (0.28)
Black or African American only . . . . .	30,048	53.5 (0.63)	Black . . . . .	30,690	53.6 (0.63)
American Indian or Alaska Native only . . . . .	2,003	44.2 (1.97)	American Indian or Alaska Native . . . . .	2,316	43.5 (1.85)
Asian only . . . . .	6,896	68.0 (1.39)	Asian or Pacific Islander . . . . .	7,146	68.2 (1.34)
Native Hawaiian or Other Pacific Islander only . . . . .	173	75.0 (7.43)			
Two or more races total . . . . .	4,203	60.9 (1.17)			
Black or African American; white . . . . .	686	59.5 (3.21)			
American Indian or Alaska Native; white . . . . .	2,022	60.0 (1.71)			
Asian; white . . . . .	590	71.9 (3.39)			
Native Hawaiian or Other Pacific Islander; white . . . . .	56	59.2 (10.65)			
Race, any mention					
White, any mention . . . . .	171,817	75.8 (0.28)			
Black or African American, any mention . . . . .	31,147	53.6 (0.62)			
American Indian or Alaska Native, any mention . . . . .	4,365	52.4 (1.40)			
Asian, any mention . . . . .	7,639	68.4 (1.27)			
Native Hawaiian or Other Pacific Islander, any mention . . . . .	283	68.7 (6.23)			
Hispanic origin and race					
Not Hispanic or Latino			Not Hispanic		
White only . . . . .	146,109	78.9 (0.27)	White . . . . .	149,057	78.6 (0.27)
Black or African American only . . . . .	29,250	53.9 (0.64)	Black . . . . .	29,877	54.0 (0.63)
American Indian or Alaska Native only . . . . .	1,620	45.2 (2.15)	American Indian or Alaska Native . . . . .	1,859	44.6 (2.05)
Asian only . . . . .	6,623	68.2 (1.43)	Asian or Pacific Islander . . . . .	6,999	68.4 (1.40)
Native Hawaiian or Other Pacific Islander only . . . . .	145	76.4 (7.79)			
Two or more races total . . . . .	3,365	62.6 (1.18)			
Hispanic or Latino . . . . .	31,040	48.8 (0.74)	Hispanic . . . . .	31,040	48.8 (0.74)

NOTES: The Office of Management and Budget's (OMB) 1997 *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity* specify five race groups (white, black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander) and allows respondents to report one or more race groups. Estimates for single-race and multiple-race groups not shown above do not meet standards for statistical reliability or confidentiality (relative standard error greater than 30%). Race groups under the 1997 Standards were based on the question, "What is the group or groups which represents [person's] race?" For persons who selected multiple groups, race groups under the OMB's 1977 Race and Ethnic Standards for Federal Statistics and Administrative Reporting were based on the additional question, "Which of those groups would you say best represents [person's] race?" Race-specific estimates in this table were calculated after excluding respondents of other and unknown race. Other published race-specific estimates are based on files in which such responses have been edited. Estimates are age adjusted to the year 2000 standard population using three age groups: under 18, 18–44, and 45–64. See [Appendix II](#), Age adjustment.

SOURCE: NCHS, National Health Interview Survey. See [Appendix I](#), National Health Interview Survey (NHIS).

the probability of death for Hispanic persons over age 80 is estimated as a function of non-Hispanic white mortality with the use of the Brass relational-logit model. For more information, see: Arias E. United States life tables by Hispanic origin. National Center for Health Statistics. Vital Health Stat 2(152). 2010. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_152.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_152.pdf).

Life tables are used in the calculation of life expectancy and have been available since 1945. From 1945 through 1996, the annual life tables were abridged life tables, closed at age 85 and over, and were constructed by reference to a

standard table. Beginning with 1997 mortality data, a new methodology similar to that of the 1989–1991 decennial life tables was employed to estimate annual complete life tables to age 100, with combined life table values presented for ages 100 and over. The methodology was again revised for 2000–2007 using a methodology similar to that of the 1999–2001 decennial life tables. Beginning with 2008 data, the life table methodology was refined by changing the smoothing technique used to estimate the life table functions at the oldest ages. All intercensal life tables (2001–2009) were revised with the new methodology and the intercensal

population estimates. For a full description of the 2008 life table methodology, the methodology used to estimate the current U.S. life tables, see: Arias E. United States life tables, 2008. National Vital Statistics Reports; vol 61 no 3. Hyattsville, MD: National Center for Health Statistics. 2012. Available from: [https://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61\\_03.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_03.pdf). Starting with *Health, United States, 2016*, life expectancy estimates for 2010 and beyond were revised to reflect updated race and Hispanic-origin classification ratios. See: Arias E, Heron M, Hakes JK. The validity of race and Hispanic-origin reporting on death certificates in the United States: An update. National Center for Health Statistics. Vital Health Stat 2(172). 2016. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_172.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_172.pdf). Additional life table estimates are available from the life tables website at: [https://www.cdc.gov/nchs/products/life\\_tables.htm](https://www.cdc.gov/nchs/products/life_tables.htm).

**Low birthweight**—See [Appendix II](#), Birthweight.

**Mammography**—An x-ray image of the breast used to detect irregularities in breast tissue. In the National Health Interview Survey (NHIS), questions concerning use of mammography are asked on an intermittent schedule, and question content has differed across years. Mammograms may be used for diagnostic or screening purposes, but the purpose cannot be determined from NHIS.

In *Health, United States*, use of mammography was defined as “percent of women having a mammogram within the past two years.” Survey questions have changed over time.

In 1987 and 1990, women were asked to report the number of days, weeks, months, or years that had passed since their most recent mammogram. In 1991, women were asked whether they had a mammogram in the past 2 years. In 1993 and 1994, women were asked whether they had a mammogram within the past year, between 1 to 2 years ago, or more than 2 years ago. In 1998, women were asked whether they had a mammogram a year ago or less, more than 1 year but not more than 2 years, more than 2 years ago but not more than 3 years, more than 3 years but not more than 5 years, or more than 5 years ago.

In 1999, women were asked to report the number of days, weeks, months, or years that had passed since their most recent mammogram. Estimates for 1999 may be slightly overestimated in comparison with previous years: women who responded “2 years ago” (10% of women) may include those who received a mammogram more than 2 years but less than 3 years ago.

In 2000 and 2003, women were asked when they had their most recent mammogram (asked to give month and year). Women who did not respond were given a follow-up question that used the 1999 wording, and women who did not respond to the 1999 wording were asked a second follow-up question that used the 1998 wording. Estimates for 2000 and 2003 may be slightly overestimated in comparison with estimates prior to 1999: women who responded “2 years ago” (2% of women) may include those who received a mammogram more than 2 years but less than 3 years ago.

In 2005, women were asked the same series of mammography questions as in the 2000 and 2003 surveys, but the questionnaire skip pattern was modified so that more women were asked the follow-up question using the 1998 wording. Thus, estimates for 2005 and subsequent years are more precise than estimates for 1999, 2000, and 2003. SAS code to categorize mammography data for 2000 and beyond is available from: [https://www.cdc.gov/nchs/nhis/nhis\\_2005\\_data\\_release.htm](https://www.cdc.gov/nchs/nhis/nhis_2005_data_release.htm). In 2008, 2010, 2013, and 2015, the mammography questions were identical to those asked in 2005.

The recommended age to begin mammography screening and the interval between screenings has changed over time. The current recommendation, made by the U.S. Preventive Services Task Force (USPSTF) in 2016, is the use of screening mammography for breast cancer every 2 years in women aged 50–74. For women aged 40–49, the USPSTF notes that the decision to start screening should be an individual one, taking into account a woman’s health history, preferences, and how she values the different potential benefits and harms. For additional information, see: U.S. Preventive Services Task Force. Breast cancer: Screening. 2016. Available from: <https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/breast-cancer-screening1>.

**Managed care**—A term originally used to refer to prepaid health plans (generally, health maintenance organizations, or HMOs) that furnish care through a network of providers under a fixed budget and “manage” costs. Increasingly, the term is also used to include preferred provider organizations (PPOs) and even forms of indemnity insurance coverage (i.e., fee-for-service insurance).

Medicare managed care includes a combination of risk- and cost-based plans. Risk-based plans receive a fixed prepayment per beneficiary per month to help pay for the cost of all covered services that a beneficiary may use. Each year, the Centers for Medicare & Medicaid Services (CMS) announces a “benchmark” amount for each county for coverage of Medicare Part A and Part B services. A managed care plan contracting with Medicare then submits a “bid,” which represents the revenue it needs to cover these services. If the bid is above the benchmark, the difference must be charged in a premium to the enrollees of the plan. If the bid is below the benchmark, then a portion of the difference must be used to provide additional benefits to enrollees, with the Medicare trust funds receiving the remaining share. The term Medicare Advantage is used to refer to managed care plans, including HMOs, PPOs, private fee-for-service plans, special needs plans, Medicare medical savings account plans, and certain other types of plans.

Cost-based plans are offered by an HMO or a competitive medical plan and are paid for their “reasonable costs” in providing Medicare services to enrollees, based on annual cost reports filed with CMS. For current definitions of the various Medicare managed care plans, see Chapter 1, section 30 (“Other MA Plans”) in the CMS “Medicare Managed Care Manual,” available from: <https://www>.

[cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/mc86c01.pdf](https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/mc86c01.pdf).

Medicare enrollees can choose to enroll in a managed care program (if available) or to receive services on a fee-for-service basis.

The two major Medicaid managed care categories are risk-based plans (such as managed care organizations [MCOs], prepaid inpatient health plans, and prepaid ambulatory health plans) and primary care case management (PCCM) arrangements. Risk-based plans are paid a fixed fee per enrollee, which is generally paid on a monthly basis. Risk-based plans assume some or all of the financial risk for providing the services covered under the contract. PCCM providers are usually physicians, physician group practices, or entities employing or having other arrangements with such physicians, but they can also include nurse practitioners, nurse midwives, or physician assistants. These providers contract directly with the state to locate, coordinate, and monitor covered primary care (and sometimes additional services). PCCM providers are paid a per-patient case management fee and usually do not assume financial risk for the provision of services. Some states allow Medicaid enrollees to voluntarily enroll in managed care plans; most states require that at least certain categories of Medicaid beneficiaries join such plans. Both risk-based plans and PCCM arrangements include plans that provide specialized services to certain categories of Medicaid beneficiaries. For more information on state Medicaid managed care plans, see <https://www.medicaid.gov/>. (Also see [Appendix II](#), Health maintenance organization [HMO]; Medicare; Medicaid; Preferred provider organization [PPO].)

**Marital status**—Classified through self-reporting in the categories married and unmarried. The term “married” encompasses all married people, including those separated from their spouses. “Unmarried” includes those who are single (never married), divorced, or widowed.

**Birth file**—In 1970, 39 states and the District of Columbia (D.C.), and in 1975, 38 states and D.C., included a direct question about mother’s marital status on the birth certificate. Since 1980, national estimates of births to unmarried women have been based on two methods for determining marital status: a direct question in the birth registration process and inferential procedures. For 1980–1996, marital status was reported on the birth certificates of 41 to 45 states and D.C.; with the addition of California in 1997, 46 states and D.C.; and for 1998–2001, 48 states and D.C. In 1997, all but four states (Connecticut, Michigan, Nevada, and New York), and in 1998, all but two states (Michigan and New York) included a direct question about mother’s marital status on their birth certificates. For 1998–2007, marital status was imputed as married on birth records with missing information in the 48 states and D.C. where this information was obtained by a direct question. For 2008–2016 for 49 states and D.C., marital status was reported in the birth registration process. Marital status is imputed if missing on the birth certificate; for 2014–

2016 mother’s marital status was imputed for less than 0.1% of birth records in the reporting areas.

For states lacking a direct question, marital status was inferred. Before 1980, the incidence of births to unmarried women in states with no direct question on marital status was assumed to be the same as the incidence in reporting states in the same geographic division. Starting in 1980, for states without a direct question, marital status was inferred by comparing the parents’ and child’s surnames. For 1994–1996, birth certificates in 45 states and D.C. included a question about the mother’s marital status. Beginning in 1997, the marital status of women giving birth in California and Nevada has been determined by a direct question in the birth registration process. Beginning June 15, 1998, Connecticut discontinued inferring the mother’s marital status and added a direct question regarding mother’s marital status to the state’s birth certificate.

In 2005, Michigan added a direct question to the birth registration process, but it uses inferential procedures to update information collected using the direct question. In both Michigan and New York, a birth is inferred as nonmarital if either of these factors, listed in priority-of-use order, is present: (a) a paternity acknowledgment was received or (b) the father’s name is missing. For 2006–2008 data, inferential procedures were used to compile birth statistics by marital status, in full or in part, for New York and Michigan, respectively. For 2009–2016 mother’s marital status is inferred for New York birth records where it was missing.

**National Health Interview Survey (NHIS)**—In NHIS, marital status is asked of, or about, all persons aged 14 and over. Respondents are asked, “Are you now married, widowed, divorced, separated, never married, or living with a partner?” In tables, these responses are categorized into three groups: married; divorced, separated, widowed; and never married.

**Medicaid**—Authorized in 1965 and became Title XIX of the Social Security Act. Medicaid is a jointly funded cooperative venture between the federal and state governments to assist states in the provision of adequate medical care to eligible persons. Within broad federal guidelines, each state establishes its own eligibility standards; determines the type, amount, duration, and scope of services; sets the rate of payment for services; and administers its own program.

Medicaid is the largest program providing medical and health-related services to low-income individuals. Medicaid was originally available only to individuals receiving cash assistance, but over time, Congress has expanded eligibility for children and selected adult groups. Most recently, the Affordable Care Act (ACA) and the Health Care and Education Reconciliation Act (HCERA) initiated significant changes to Medicaid. (Subsequent references to ACA in this text will include changes enacted by either ACA or HCERA).

States are mandated by federal law to cover certain

population groups (mandatory eligibility groups) but are granted flexibility in covering other groups (optional eligibility groups). In the standard benefit package, states must cover mandatory benefits (e.g., physician services) but may choose to cover optional benefits (e.g., tuberculosis-related services). Prior to ACA, many states expanded Medicaid coverage above the federal minimums, and many states have chosen to continue this additional coverage. The major coverage change introduced by ACA was to create a new eligibility group—Medicaid expansion to Low-Income Adults—for those with incomes not exceeding 138% of the federal poverty level (FPL) (133% by statute with an additional 5% income disregard). This group is discussed in more detail below.

States set individual eligibility criteria within federal minimum standards. In addition to Medicaid’s financial eligibility requirements, individuals must satisfy federal and state requirements regarding residency, immigration status, and documentation of U.S. citizenship. ACA provided a standard application—available through the Medicaid program or through the Health Insurance Marketplace—and a standard method for calculating income eligibility for Medicaid, the Children’s Health Insurance Program (CHIP), and insurance affordability programs offered through the marketplace, based primarily on modified adjusted gross income (MAGI). Effective 2014, MAGI is used to determine Medicaid and CHIP eligibility for most nondisabled children and adults under age 65.

Broadly, there are four major eligibility groups covered by most states: Children, Adults with Disabilities, Aged Adults, and Nondisabled Adults. These are discussed in more detail below.

### **Major eligibility groups**

*Children*—Medicaid was originally available only to individuals receiving cash assistance, but Congress has since expanded eligibility for children and other populations, making individuals eligible based on income below a specified percentage of the FPL. ACA raised the minimum Medicaid eligibility for nondisabled children not exceeding 138% FPL (133% by statute with an additional 5% income disregard). Other eligible child groups include: infants born to women covered by Medicaid (known as “deemed newborns”), certain children in foster care or adoption assistance programs, certain children with disabilities, and children who use long-term services and supports. Like disabled adults, most states automatically qualify disabled children in the Supplemental Security Income (SSI) program for Medicaid coverage; eligibility is not determined by the newly introduced MAGI. Some states use more restrictive criteria to determine Medicaid eligibility of children with SSI. These criteria are usually based on income relative to the FPL and assets. Regardless of how they qualify, all children enrolled in Medicaid are entitled to all 1905(a) mandatory and optional services for Medicaid categorically eligible children under age 21. This comprehensive set of health care services is known

as Early, Periodic Screening, Diagnostic and Treatment. These services include screening for and treatment of any vision or hearing problems, coverage for eyeglasses and hearing aids, and regular preventive dental care and treatment.

*Adults with Disabilities*—Adults with disabilities from physical conditions, intellectual or development disabilities, serious behavioral disorders, or serious mental illness may be eligible for Medicaid. The SSI program pays benefits to disabled adults and children who have limited income and resources. Enrollment in SSI (or the Social Security Disability Insurance program, which provides Medicare to qualified individuals after a 24-month waiting period) automatically qualifies adults with disabilities for Medicaid in most states. However, some states use more restrictive criteria (known as 209(b) of the 1972 amendments to the Social Security Act) to determine Medicaid eligibility. These criteria are often based on income relative to the FPL and assets. As of December 2016, 10 states used more restrictive criteria than enrollment in SSI. Individuals with disabilities who are eligible for Medicaid are entitled to receive all 1905(a) mandatory Medicaid state plan benefits and the optional benefits that their state covers, based on medical necessity.

All states have the option of covering additional people with low incomes or high medical expenses through other eligibility pathways. These may include covering those at higher income levels; permitting persons with disabilities and high medical expenses to spend down until they are eligible for coverage; setting a special income level to cover institutionalized individuals with incomes up to 300% of the SSI benefit rate; extending coverage to individuals who receive home- and community-based waiver services as an alternative to institutionalization; permitting working individuals who are severely impaired but whose earnings would otherwise disqualify them from Medicaid to buy into Medicaid; or covering adults with disabilities who use long-term services and supports based on their functional status (known as level-of-care) and use of services (e.g., residence in a nursing facility, intermediate care facility for persons with intellectual disabilities, or mental health facility, or requiring significant home-based services).

*Aged Adults*—The SSI program covers those with disabilities and people aged 65 and over without disabilities who meet the financial limits. In most states, SSI enrollment automatically qualified those aged 65 and over for Medicaid. However, some states use more restrictive criteria (known as 209(b)) to determine Medicaid eligibility. The more restrictive criteria may consider income and assets, disability, or both. Most Medicaid enrollees aged 65 and over are also Medicare beneficiaries. Members of this group are known as “dual-eligible beneficiaries” or “dual eligibles.” Dual

eligibles are eligible for the same Medicare benefits as other Medicare beneficiaries but have low incomes that make it difficult to afford the premiums and cost sharing required by Medicare, as well as the cost of services not covered by the Medicare program (e.g., long-term services and supports). Dual eligibles may qualify for partial Medicaid benefits (to cover Medicare premium and cost sharing) or full Medicaid benefits, in which case they get coverage for the full range of services offered by their state's Medicaid program.

Like coverage for adults with disabilities, states may extend Medicaid coverage to adults with low incomes or high medical expenses through other eligibility pathways, such as covering those with higher income levels or those with chronic conditions or low functional status requiring institutionalization or significant home-based services. There is considerable variation across states in the optional Medicaid services covered, which results in different benefits for dual-eligible beneficiaries depending on where they live.

*Nondisabled Adults*—Prior to the enactment of ACA, most low-income nondisabled adults were not eligible for Medicaid unless they were in special groups (e.g., pregnant women, low-income parents, or other caretaker relatives with dependent children) or in states with demonstration programs that provided expanded coverage.

The major eligibility groups of nondisabled adults include the following: Medicaid Expansion to Low-income Adults (eligibility group created by the ACA), Pregnant Women, Parents and Caretaker Relatives, and Adults Without Dependent Children. These groups and some specialty eligible groups—Breast and Cervical Cancer Prevention and Treatment Program and Tuberculosis (TB)—are discussed below.

*Medicaid Expansion to Low-income Adults*—As of October 2016, 31 states and the District of Columbia (D.C.) had chosen to expand their Medicaid programs. These states include: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont, Washington, and West Virginia. Maine and Virginia expanded their Medicaid programs in 2018 and 2019, respectively. Nebraska and Idaho have submitted state plan amendments to expand their Medicaid programs; these amendments are currently under review by CMS.

*Pregnant Women*—Since 1989, Congress has required Medicaid to cover pregnant women with low income. Currently, all but four states have extended Medicaid coverage to pregnant women above the currently required level of 138% FPL. Maternity-related services

covered by the programs include prenatal care, labor and delivery, and 60 days of postpartum care. In Medicaid-expansion states, women at or below 138% FPL who are pregnant when they apply for Medicaid are not eligible for the new adult group. Medicaid coverage as a pregnant woman ends 2 months postpartum (after which the individual may be eligible in another Medicaid eligibility group).

*Parents and Caretaker Relatives*—Parents and caretaker relatives in low-income families with dependent children are eligible for coverage if their income meets the minimum eligibility levels established in 1996 for financial and medical assistance, which averages 41% of poverty level; 1996 was the year of enactment for welfare reform, which held in place guaranteed Medicaid eligibility for those receiving cash benefits at that time. States have the option to be more or less restrictive than the 1996 standards.

*Adults without Dependent Children*—Prior to ACA, about one-half of states provided some coverage, through Medicaid demonstration projects or state-funded programs, for nondisabled adults who had limited incomes but did not otherwise qualify for Medicaid. Currently, 31 states and D.C. have implemented ACA Medicaid expansion for adults with incomes not exceeding 138% of the federal poverty level (FPL) (133% by statute with an additional 5% income disregard).

## **Other eligibility groups**

*Breast and Cervical Cancer Prevention and Treatment Program*—In 2000, Congress passed the Breast and Cervical Cancer Prevention and Treatment Act, which allowed states to offer eligible women, who were diagnosed with cancer through the Centers for Disease Control and Prevention (CDC)-funded screening program, access to treatment through Medicaid. All states and D.C. have chosen to provide this coverage. For a woman to be eligible under this option, she must be under age 65; have been screened through CDC's National Breast and Cervical Cancer Early Detection Program; be diagnosed with either breast or cervical cancer, including precancerous conditions; need treatment for breast or cervical cancer; and be uninsured and otherwise not eligible for Medicaid.

*Tuberculosis (TB)*—States can choose to provide Medicaid coverage of TB-related services for low-income individuals who are infected with TB. This eligibility group serves individuals who are not otherwise eligible for Medicaid based on the traditional eligibility categories.

Medicaid operates as a vendor payment program. States may pay health care providers directly on a fee-for-service basis, or states may pay for Medicaid services through various prepayment arrangements, such as through Medicaid managed care organizations or other forms of managed care. Within federally imposed upper limits and restrictions, each

state generally has broad discretion in determining both the payment method and rate for services. Thus, the Medicaid program varies considerably from state to state, as well as within each state over time. For more information, see: <https://www.medicaid.gov/> and <https://www.macpac.gov/>. (Also see [Appendix II](#), Children’s Health Insurance Program [CHIP]; Health expenditures, national; Health insurance coverage; Health maintenance organization [HMO]; Managed care.)

**Medicare**—A nationwide program providing health insurance coverage to selected groups, regardless of income. The covered groups are (a) most people aged 65 and over; (b) people entitled to Social Security or Railroad Retirement disability benefits for at least 24 months (with the waiting period waived or reduced in certain situations); (c) government employees or spouses with Medicare-only coverage who have been disabled for more than 29 months (with the waiting period waived or reduced in certain situations); (d) most people with end-stage renal disease; and (e) certain people in the Libby, Montana, vicinity who are diagnosed with asbestos-related conditions. The program was enacted on July 30, 1965, as Title XVIII of the Social Security Act, “Health Insurance for the Aged and Disabled,” and became effective on July 1, 1966.

From its inception, Medicare has included two separate but coordinated programs: Hospital Insurance (Part A) and Supplementary Medical Insurance (Part B). Part C (“Medicare Advantage”) was established by the Balanced Budget Act of 1997 (originally as “Medicare+Choice”) as an expanded set of options for the delivery of health care under Medicare. Although all Medicare beneficiaries can receive their benefits through the original fee-for-service program, most beneficiaries enrolled in both Part A and Part B have the option to participate in a Medicare Advantage plan instead.

Organizations that seek to contract as Medicare Advantage plans must meet specific organizational, financial, and other requirements. Although most Medicare Advantage enrollees are in coordinated care plans, such as health maintenance organizations and preferred provider organizations, Medicare Advantage plans also include private fee-for-service plans, provider-sponsored organizations, special needs plans, medical savings account plans (which provide benefits after a single high deductible is met), and certain other types of plans. Medicare Advantage plans are generally paid on a capitation basis—that is, plans are paid a predetermined amount per member per month, which is adjusted according to the health status of the plans’ members—and are required to provide at least those services covered by Parts A and B, except hospice services. Plans may (and in certain situations must) provide extra benefits (such as vision or hearing coverage) or reduce cost sharing or premiums.

The Medicare Prescription Drug, Improvement, and Modernization Act (also called the Medicare Modernization Act, or MMA) was passed on December 8, 2003. MMA (P. L. 108–173) established a voluntary prescription drug benefit for Medicare beneficiaries and created a new Medicare

Part D. People eligible for Medicare could begin to enroll in Part D beginning in January 2006. For more information on Medicare, see: <https://www.medicare.gov/Pubs/pdf/10050-Medicare-and-you.pdf> and <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/CMSProgramStatistics/index.html>. (Also see [Appendix II](#), Fee-for-service health insurance; Health insurance coverage; Health maintenance organization [HMO]; Managed care.)

**Metropolitan statistical area (MSA)**—A geographic entity based on a county or a group of counties with at least one urbanized area with a population of at least 50,000 and adjacent counties with economic ties to the central area. The economic ties are measured by commuting. Similar standards are used to define micropolitan statistical areas, except that the urban clusters are smaller with a population between 10,000 and 49,999. Counties that are not classified as metropolitan or micropolitan statistical areas are outside the U.S. Office of Management and Budget (OMB) classification. Metropolitan and micropolitan statistical areas are defined (“delineated”) by OMB by applying published standards to data. A new set of standards are published once every 10 years, in the year of the decennial census. Then 3 years later, OMB issues the list of metropolitan and micropolitan statistical areas and their county components after the standards have been applied using census and commuting data. Between the once-a-decade comprehensive review of statistical area standards and delineations, OMB issues periodic updates reclassifying counties to reflect current population data. For more information, see: <https://www.census.gov/programs-surveys/metro-micro.html>. The most recent standards were published by OMB (available from: [https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/fedreg\\_2010/06282010\\_metro\\_standards-Complete.pdf](https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/fedreg_2010/06282010_metro_standards-Complete.pdf)). The 2013 OMB bulletin with the county classifications is available from: <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/bulletins/2013/b13-01.pdf>. Data systems adopt MSA standards some time after they are published. The adoption of a new set of standards or subsequent reclassifications may create a discontinuity in trends.

**National Health Interview Survey (NHIS)**—The place of residence of respondents to NHIS is classified as metropolitan or nonmetropolitan. Since the 2016 data release, the metropolitan variable has been based on the 2013 county classifications.

**National Immunization Surveys (NIS)**—Starting with 2010 data, NIS has included an MSA variable based on the respondent’s location of residence. If county of residence is not provided during the household interview, the method for determining MSA depends upon the sampling frame (landline or cell phone). For landline telephone numbers, MSA is assigned based upon the telephone exchange. For cell phone numbers, MSA is imputed using a hot-deck process.

**Neonatal mortality rate**—See [Appendix II](#), Rate: Death and related rates.

**Nonprofit hospital**—See [Appendix II](#), Hospital.

**Notifiable disease**—A disease that, when diagnosed, requires health providers (usually by law) to report to state or local public health officials. Notifiable diseases are of public interest by reason of their contagiousness, severity, or frequency. For more information, see: <https://wwwn.cdc.gov/nndss/>.

**Nursing home expenditures**—See [Appendix II](#), Health expenditures, national.

**Obesity**—See [Appendix II](#), Body mass index (BMI).

**Overweight**—See [Appendix II](#), Body mass index (BMI).

**Pap smear**—A microscopic examination of cells scraped from the cervix that is used to detect cancerous or precancerous conditions of the cervix or other medical conditions (also known as a Papanicolaou smear or Pap test).

In the National Health Interview Survey (NHIS), questions concerning Pap smear use are asked on an intermittent schedule, and the question content has differed slightly across years. In the 2015 NHIS, women aged 18 and over were asked when they had their most recent Pap smear. In *Health, United States*, use of Pap smears was defined as the percent of women who reported having a Pap smear within the past 3 years.

In 1987, women were asked to report either the month and year of their Pap smear or the amount of time (in days, weeks, months, or years) elapsed since their last Pap smear. Women who did not respond were asked, “Was it within the past year or a year or more ago?” Those who answered “within the past year” were asked to further clarify whether the Pap smear was less than 3 months, or 3 or more months ago, and those who answered “a year or more ago” were asked to further clarify whether the Pap smear was 3 years or less, between 3 and 5 years, or 5 or more years ago.

In 1990 and 1991, Pap smear data in the past 3 years were not available. In 1993 and 1994, women were asked whether they had a Pap smear within the past year, between 1 and 3 years ago, or more than 3 years ago. In 1998, women were asked whether they had a Pap smear 1 year ago or less, more than 1 year but not more than 2 years ago, more than 2 years but not more than 3 years ago, more than 3 years but not more than 5 years ago, or more than 5 years ago.

In 1999, women were asked when they had their most recent Pap smear (time elapsed in days, weeks, months, or years). Women who did not respond were asked whether they had a Pap smear a year ago or less, more than 1 year but not more than 2 years ago, more than 2 years but not more than 3 years ago, more than 3 years but not more than 5 years ago, or more than 5 years ago. Estimates for 1999 may be slightly overestimated in comparison with estimates for previous years due to the inclusion of women who responded “3 years ago” (4% of women), which could have included more than 3 years but less than 4 years.

In 2000 and 2003, women were asked when they had their most recent Pap smear (month and year). Women who did not respond were given a follow-up question that used

the 1999 wording, and women who did not respond to the follow-up question were asked a second follow-up question that used the 1998 wording. Estimates for 2000 and 2003 may be slightly overestimated in comparison with years prior to 1999 due to the inclusion of women who responded “3 years ago” (less than 1% of women), which could have included more than 3 years but less than 4 years.

In 2005, women were asked the same series of questions about Pap smear use as in the 2000 and 2003 surveys, but the questionnaire skip pattern was modified so that more women were asked the follow-up question using the 1998 wording, and these women were not uniformly coded as having had a Pap smear within the past 3 years. Thus, estimates for 2005 are more precise than estimates for 1999, 2000, and 2003. SAS code to categorize Pap smear data for 2000 and beyond is available from: [https://www.cdc.gov/nchs/nhis/nhis\\_2005\\_data\\_release.htm](https://www.cdc.gov/nchs/nhis/nhis_2005_data_release.htm).

In 2008, 2010, 2013, and 2015 Pap smear questions were similar to those asked in 2005.

All women aged 18 and over were asked the Pap smear question(s). Women who reported having had a hysterectomy (removal of the uterus, with or without removal of the ovaries and cervix) were still asked the Pap smear questions because a woman who has had a hysterectomy may still have had Pap smear testing.

As of 2012, the U.S. Preventive Services Task Force (USPSTF) had recommended the use of Pap smears for cervical cancer screening every 3 years in women aged 21–65, with additional recommendations available for women aged 30–65 who want to lengthen the recommended screening interval. In *Health, United States, 2014*, additional age groups (18–20, 21–24, and 21–44) were added to account for the new recommendation. For more information on the 2012 recommendations, see: <https://annals.org/aim/fullarticle/1183214/screening-cervical-cancer-u-s-preventive-services-task-force-recommendation>.

In 2018, the USPSTF further refined their recommendations. For the latest recommendation on the use of Pap smears for cervical cancer screening, see: <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening2>.

The USPSTF recommends against screening for cervical cancer in women who have had a hysterectomy with removal of the cervix and do not have a history of a high-grade precancerous lesion (i.e., cervical intraepithelial neoplasia [CIN] grade 2 or 3) or cervical cancer. To account for this recommendation given data availability, two measures of Pap smear screening are presented in *Health, United States*: one among all women and one among women who did not report having a hysterectomy. NHIS does not collect sufficient data to determine whether a woman had a hysterectomy that included removal of the cervix, or whether a woman had a history of a high-grade precancerous lesion. Questions about whether the respondent had a hysterectomy were not asked in 2003. For other survey years, questions about hysterectomy in NHIS differed slightly, as follows.

In 1987, women who reported that they had not had a recent Pap smear were asked the most important

reason they had not had a Pap smear; one reason women could select was “had a hysterectomy.” In 1993, 1994, 1998, 1999, 2013, and 2015, women were asked, “Have you had a hysterectomy?” In 2000, 2005, 2008, and 2010, two questions were used to determine whether women had a hysterectomy. Women were asked, “Have you had a hysterectomy?” In addition, women who reported that they had not had a recent Pap smear were asked the most important reason they had not had a Pap smear; one reason women could select was “had hysterectomy.” Women responding to either of these questions that they had a hysterectomy were excluded from the *Health, United States* estimates for the group “Percent of women having a Pap smear within the past 3 years, among those who have not had a hysterectomy.”

**Percent change/percentage change**—See [Appendix II](#), Average annual rate of change (percent change).

**Perinatal mortality rate; ratio**—See [Appendix II](#), Rate: Death and related rates.

**Personal health care expenditures**—See [Appendix II](#), Health expenditures, national.

**Physical activity, leisure-time**—Starting with 1997 data, leisure-time physical activity has been assessed in the National Health Interview Survey (NHIS) by asking adults a series of questions about how often they do vigorous or light or moderate physical activity of at least 10 minutes duration and about how long these sessions generally last. All questions related to leisure-time physical activity were phrased in terms of current behavior and lack a specific reference period. Vigorous physical activity is described as causing heavy sweating or a large increase in breathing or heart rate, and light or moderate physical activity is described as causing light sweating or a slight-to-moderate increase in breathing or heart rate. Adults were also asked about how often they did leisure-time physical activities specifically designed to strengthen their muscles, such as lifting weights or doing calisthenics.

Even though the wording for the physical activity question series has remained essentially unchanged since 1997, the phrase “leisure-time” was included in each question starting with the 2004 NHIS. Prior to the 2004 NHIS, “leisure-time” only appeared once, as a part of the introduction to the question series. For more information, see the NHIS Adult Physical Activity Information website at: [https://www.cdc.gov/nchs/nhis/physical\\_activity.htm](https://www.cdc.gov/nchs/nhis/physical_activity.htm).

Starting with *Health, United States, 2010*, estimates of leisure-time physical activity changed to reflect the federal 2008 Physical Activity Guidelines for Americans (available from: <https://health.gov/PAGuidelines/guidelines/default.aspx>). Adults who met the 2008 guidelines reported at least 150 minutes per week of moderate-intensity aerobic physical activity or 75 minutes per week of vigorous-intensity aerobic physical activity (or an equivalent combination of moderate- and vigorous-intensity aerobic activity) and muscle-strengthening activities at least twice a week. The 2008 guidelines recommend any kind of aerobic activity,

not just leisure-time aerobic activity, so the leisure-time aerobic activity estimates presented in this report may underestimate the percentage of adults who met the 2008 guidelines for aerobic activity. The estimates for the percentage of Americans who met the 2008 guidelines for aerobic physical activity and muscle-strengthening are not comparable with estimates in previous editions of *Health, United States* that showed the percentage of Americans with regular leisure-time physical activity. For more information, see: Carlson SA, Fulton JE, Schoenborn CA, Loustalot F. Trend and prevalence estimates based on the 2008 Physical Activity Guidelines for Americans. *Am J Prev Med* 39(4):305–13. 2010.

In November 2018, new federal recommendations for physical activity were released in the Physical Activity Guidelines for Americans, 2nd Edition (available from: [https://health.gov/paguidelines/second-edition/pdf/Physical\\_Activity\\_Guidelines\\_2nd\\_edition.pdf](https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf)). While many recommendations were similar to the 2008 guidelines, some had changed, including elimination of the requirement for physical activity of adults to occur in bouts of at least 10 minutes.

For more information, see: Piercy KL, Troiano RP, Ballard RM, Carlson SA, Fulton JE, Galuska DA, et al. The Physical Activity Guidelines for Americans. *JAMA*. Published online November 12, 2018. doi:10.1001/jama.2018.14854.

**Population**—The U.S. Census Bureau collects and publishes data on populations in the United States according to several different definitions. Various statistical systems then use the appropriate population for calculating rates. (Also see [Appendix I](#), Population Census and Population Estimates.)

*Civilian noninstitutionalized population*—Civilian population excluding persons residing in institutions (such as nursing homes, prisons, jails, mental hospitals, and juvenile correctional facilities). U.S. Census Bureau estimates of the civilian noninstitutionalized population are used to calculate sample weights for the National Health Interview Survey, the National Health and Nutrition Examination Survey, and the National Survey of Family Growth.

*Civilian population*—Resident population excluding members of the Armed Forces, although families of members of the Armed Forces are included.

*Resident population*—Includes persons whose usual place of residence (i.e., the place where one usually lives and sleeps) is in 1 of the 50 states or the District of Columbia. It includes members of the Armed Forces stationed in the United States and their families. It excludes members of the Armed Forces stationed outside the United States and civilian U.S. citizens whose usual place of residence is outside the United States. The resident population is the denominator used to calculate birth and death rates and incidence of disease.

**Postneonatal mortality rate**—See [Appendix II](#), Rate: Death and related rates.

**Poverty**—Two related versions of federal poverty measures are shown in *Health, United States*. The first measure—a ratio of family income to federal poverty threshold—is constructed using poverty thresholds from the U.S. Census Bureau. Poverty thresholds are updated annually for inflation by the Census Bureau using the Consumer Price Index for all urban consumers (CPI-U). Poverty thresholds include a set of money income thresholds that vary by family size and composition but do not vary geographically. Families or individuals with income below the appropriate threshold are classified as below poverty. For example, the weighted average poverty threshold for a family of four was \$25,094 in 2017, \$24,563 in 2016, \$24,257 in 2015, \$24,230 in 2014, \$22,314 in 2010, \$17,603 in 2000, and \$13,359 in 1990. For more information, see the U.S. Census Bureau’s poverty threshold website at: <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>.

The second poverty measure used in *Health, United States* is a ratio of family income to the U.S. Department of Health and Human Services (HHS) poverty guidelines. Poverty guidelines are derived from the U.S. Census Bureau’s poverty thresholds and are issued annually by HHS. These guidelines are often used to determine eligibility in certain federal programs. The HHS poverty guidelines take into account family size and state (coterminous states, Alaska, Hawaii), but not family composition. For more information, see the HHS “Poverty Guidelines, Research, and Measurement” website at: <https://aspe.hhs.gov/poverty-research>.

*National Health and Nutrition Examination Survey (NHANES)*—NHANES uses the U.S. Census Bureau’s Current Population Survey definition of family to group household members into a family unit. A poverty ratio is computed by dividing family income by the HHS poverty guidelines specific to family size, as well as the appropriate guideline year, and state. See: Johnson CL, Paulose-Ram R, Ogden CL, Carroll MD, Kruszon-Moran D, Dohrmann SM, Curtin LR. *National Health and Nutrition Examination Survey: Analytic guidelines, 1999–2010*. National Center for Health Statistics. *Vital Health Stat* 2(161). 2013. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_161.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_161.pdf).

*National Health Interview Survey*—For data years prior to 1997, a ratio of family income to U.S. Census Bureau poverty threshold was computed taking into account family income and family size. Starting with 1997 data, the poverty ratio was based on family income, family size, and family composition (number of children in the family, and for families with two or fewer adults, the age of the adults in the family). (Also see [Appendix II](#), Consumer Price Index [CPI]; Family income; and [Appendix I](#), Current Population Survey [CPS]; National Health Interview Survey [NHIS].)

**Preferred provider organization**—A type of medical plan in which coverage is provided to participants through a

network of selected health care providers, such as hospitals and physicians. Enrollees may seek care outside the network but pay a greater percentage of the cost of coverage than within the network. (Also see [Appendix II](#), Health maintenance organization [HMO]; Managed care.)

**Prevalence**—The number of cases of a disease, number of infected persons, or number of persons with some other attribute present during a particular interval of time. It is often expressed as a rate (e.g., the prevalence of diabetes per 1,000 persons during a year). (Also see [Appendix II](#), Incidence.)

**Private expenditures**—See [Appendix II](#), Health expenditures, national.

**Public expenditures**—See [Appendix II](#), Health expenditures, national.

**Race**—In 1977, the Office of Management and Budget (OMB) issued *Race and Ethnic Standards for Federal Statistics and Administrative Reporting* (Statistical Policy Directive 15) to promote comparability of data among federal data systems. The 1977 Standards called for the federal government’s data systems to classify individuals into the following four racial groups: American Indian or Alaskan Native, Asian or Pacific Islander, black, and white. Depending on the data source, the classification by race was based on self-classification or on observation by an interviewer or other person filling out the questionnaire. The federal government considers race and Hispanic origin to be two separate and distinct concepts. Thus, Hispanic persons may be of any race.

In 1997, revisions were announced for classification of individuals by race within the federal government’s data systems (see: *Revisions to the standards for the classification of federal data on race and ethnicity*. Fed Regist 62(210):58782–90. 1997). The 1997 Standards specify five racial groups: American Indian or Alaska Native, Asian, black or African American, Native Hawaiian or Other Pacific Islander, and white. These five categories are the minimum set for data on race in federal statistics. The 1997 Standards also offer an opportunity for respondents to select more than one of the five groups, leading to many possible multiple-race categories. As with the single-race groups, data for the multiple-race groups are to be reported when estimates meet agency requirements for reliability and confidentiality. The 1997 Standards allow for observer or proxy identification of race but clearly state a preference for self-classification. Federal data systems were required to comply with the 1997 Standards by 2003.

**Birth file**—Information about the race and Hispanic origin of the mother and father is provided by the mother at the time of birth and is recorded on the birth certificate or fetal death record. Since 1980, birth rates, birth characteristics, and death rates for live-born infants and fetal deaths are presented in *Health, United States* according to race of the mother. Before 1980, data were tabulated by race of the newborn and fetus, taking into account the race of both parents.

If the parents were of different races and one parent was white, the child was classified according to the race of the other parent. When neither parent was white, the child was classified according to father's race, with one exception: if either parent was Hawaiian, the child was classified as Hawaiian. Before 1964, if race was unknown, the birth was classified as white. Starting in 1964, unknown race was classified according to information on the birth record. Starting with the 2000 Census, the race and ethnicity data used for denominators (population) to calculate birth and fertility rates have been collected in accordance with the 1997 revised OMB standards for race and ethnicity. However, the numerators (births) will not be compatible with the denominators until all the states revise their birth certificates to reflect the new standards. To compute rates, it was necessary to bridge population data for multiple-race persons to single-race categories. (Also see [Appendix I](#), Population Census and Population Estimates, Bridged-race Population Estimates.)

Starting with 2003 data, some states began using the 2003 revision of the U.S. Standard Certificate of Live Birth, which allows the reporting of more than one race (multiple races). As of January 1, 2016, all states and the District of Columbia (D.C.), in addition to Puerto Rico, the U.S. Virgin Islands, Guam, and Northern Marianas, used the 2003 revision of the U.S. Standard Certificate of Live Birth and reported race according to the 1997 revised OMB standards. In 2017, 2.6% of mothers in the 50 United States and D.C. reported more than one race. To provide uniformity and comparability of data for trend comparison, bridged single-race categories are still presented in *Health, United States*. For more information on the adoption of the 2003 revision of the U.S. Standard Certificate of Live Birth, see the Technical Notes section of the annual series of "Births: Final Data" reports, available from: <https://www.cdc.gov/nchs/products/nvsr.htm>.

Although the bridging procedure imputes multiple race of mothers to one of the four minimum races stipulated in the 1977 Standards, mothers of a specified Asian or Pacific Islander (API) subgroup (Chinese, Japanese, Hawaiian, or Filipino) in combination with another race (American Indian or Alaska Native, black, or white) or another API subgroup cannot be imputed to a single API subgroup. Data for the API subgroups from all states and D.C. are available starting with the 2016 Natality public-use data file at: <https://www.cdc.gov/nchs/births.htm>.

**Mortality file**—Information about the race and Hispanic origin of a decedent is reported by the funeral director as provided by an informant (often the surviving next of kin), or in the absence of an informant, on the basis of observation. Death rates by race and Hispanic origin are based on information from death certificates (numerators of the rates) and on population estimates from the U.S. Census Bureau (denominators). Race and ethnicity information from the census is by self-

report. To the extent that race and Hispanic origin are inconsistent between these two data sources, death rates will be biased. Studies have shown that persons self-reported as American Indian, Asian, or Hispanic on census and survey records may sometimes be reported as white or non-Hispanic on the death certificate, resulting in an underestimation of deaths and death rates for the American Indian, Asian, and Hispanic groups. Bias also results from undercounts of some population groups in the census—particularly young black males, young white males, and elderly persons—resulting in an overestimation of death rates.

Race and ethnicity reporting on the death certificate continues to be excellent for the white and black populations. It remains poor for the American Indian or Alaska Native population but is reasonably good for the Hispanic and Asian or Pacific Islander populations. Decedent characteristics such as place of residence and nativity have an important effect on the quality of reporting on the death certificate. The effects of misclassification on mortality estimates were most pronounced for the American Indian or Alaska Native population, where correcting for misclassification reverses a large American Indian or Alaska Native-over-white mortality advantage to a relatively large disadvantage. Among the Hispanic and Asian or Pacific Islander populations, adjustment for death certificate misclassification did not significantly affect minority-majority mortality. For more information, see: Arias E, Heron M, Hakes JK. The validity of race and Hispanic-origin reporting on death certificates in the United States: An update. *National Center for Health Statistics. Vital Health Stat 2(172)*. 2016. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_172.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_172.pdf); Arias E, Schauman WS, Eschbach K, Sorlie PD, Backlund E. The validity of race and Hispanic origin reporting on death certificates in the United States. *National Center for Health Statistics. Vital Health Stat 2(148)*. 2008. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_02/sr02\\_148.pdf](https://www.cdc.gov/nchs/data/series/sr_02/sr02_148.pdf).

Denominators for infant mortality rates are based on the number of live births, rather than on population estimates. Race information for the denominator is supplied from the birth certificate. Before 1980, race of child for the denominator took into account the races of both parents. Starting in 1980, race information for the denominator has been based solely on the race of the mother. Race information for the numerator is supplied from the death certificate. For the infant mortality rate, race information for the numerator is race of the deceased child.

Issues affecting the interpretation of vital event rates for the American Indian or Alaska Native population include (a) changes in the classification or self-identification of persons of American Indian or Alaska Native heritage over time, and (b) misclassification of American Indian or Alaska Native persons on death certificates by the

funeral director or informant. Vital event rates for the American Indian or Alaska Native population shown in *Health, United States* are based on the total U.S. resident American Indian or Alaska Native population, as enumerated by the U.S. Census Bureau. In contrast, the Indian Health Service calculates vital event rates for this population based on U.S. Census Bureau county data for American Indian or Alaska Native persons who reside on or near reservations. Because of misclassification of American Indian or Alaska Native persons on death certificates, American Indian or Alaska Native national and state-specific mortality estimates published in *Health, United States* should be interpreted with caution.

Interpretation of trends for the Asian population in the United States should take into account that this population more than doubled between 1980 and 1990, primarily because of immigration. Between 1990 and 2000, the increase in the Asian population was 48% for persons reporting that they were Asian alone and 72% for persons who reported they were either Asian alone or Asian in combination with another race.

Starting with 2003 data, some states began using the 2003 revision of the U.S. Standard Certificate of Death, which allows the reporting of more than one race (multiple races). This change was implemented to reflect the increasing diversity of the U.S. population and to be consistent with the decennial census. For more information on states' reporting of multiple-race data, see the annual series of "Deaths: Final Data" reports, available from: <https://www.cdc.gov/nchs/products/nvsr.htm>.

To provide uniformity and comparability of data until all states are reporting multiple-race data, it has been necessary to bridge the responses of those for whom more than one race is reported (multiple race) to one single race. For more information, see: NCHS procedures for multiple-race and Hispanic origin data: Collection, coding, editing, and transmitting. 2004. Available from: [https://www.cdc.gov/nchs/data/dvs/Multiple\\_race\\_docu\\_5-10-04.pdf](https://www.cdc.gov/nchs/data/dvs/Multiple_race_docu_5-10-04.pdf); and NCHS. Vital statistics of the United States, vol I, Natality, and vol II, Mortality, part A, Technical appendix. Published annually, available from: <https://www.cdc.gov/nchs/products/vsus/ta.htm>.

*National Health and Nutrition Examination Survey (NHANES)*—Starting with *Health, United States, 2003*, race-specific estimates based on NHANES were tabulated using the 1997 Standards for data years 1999 and beyond. Prior to data year 1999, the 1977 Standards were used. Because of the differences between the two standards, the race-specific estimates shown in trend tables presenting NHANES data for 1999 and beyond are not strictly comparable with estimates for earlier data years. Race in NHANES I and II was determined primarily by interviewer observation; starting with NHANES III, race was self-reported by survey participants.

The NHANES sample for data years 1999–2006 was designed to provide estimates specifically for persons of Mexican origin and not for all Hispanic-origin persons in the United States. Persons of Hispanic origin other than Mexican origin were entered into the sample with different selection probabilities that are not nationally representative of the total U.S. Hispanic population. Starting with 2007–2008 data, all Hispanic persons were oversampled, not just persons of Mexican origin. Oversampling of the black population was continued. Starting in 2011, NHANES oversampled the non-Hispanic Asian population. In *Health, United States*, estimates are shown for non-Hispanic white, non-Hispanic black, and Mexican-origin persons, as well as for Hispanic-origin and non-Hispanic Asian persons, where possible. Although data were collected according to the 1997 Standards, there are insufficient numbers of observations during this period to meet statistical reliability or confidentiality requirements for reporting estimates for additional race categories.

*National Health Interview Survey (NHIS)*—Starting with *Health, United States, 2002*, race-specific estimates based on NHIS were tabulated using the 1997 Standards for data year 1999 and beyond and are not strictly comparable with estimates for earlier years. The 1997 Standards specify five single-race categories and multiple-race categories. Estimates for specific race groups are shown when they meet requirements for statistical reliability and confidentiality. The race categories white only, black or African American only, American Indian or Alaska Native only, Asian only, and Native Hawaiian or Other Pacific Islander only include persons who reported only one racial group; the category 2 or more races includes persons who reported more than one of the five racial groups in the 1997 Standards or one of the five racial groups and "some other race." In order to maintain consistency with the U.S. Census Bureau procedures for collecting and editing data on race and ethnicity, NHIS made major changes to its editing procedures in the 2003 data year. Beginning with the 2003 NHIS, Other Race was no longer available as a separate race response. This response category was treated as missing, and the race was imputed if this was the only race response. In cases where Other Race was mentioned along with one or more race groups, the Other Race response was dropped, and the race group information was retained.

Prior to data year 1999, data were tabulated according to the 1977 Standards, with four racial groups, and the Asian only category included Native Hawaiian or Other Pacific Islander. Estimates for single-race categories prior to 1999 included persons who reported one race, or if they reported more than one race, identified one race as best representing their race. Differences between estimates tabulated using the two standards for data year 1999 are discussed in the footnotes for each NHIS table in *Health, United States 2002, 2003, and 2004*

editions, available from: <https://www.cdc.gov/nchs/previous.htm#editions>.

Tables IX and X illustrate NHIS data tabulated by race and Hispanic origin according to the 1997 and 1977 Standards for two health statistics (cigarette smoking and private health insurance coverage). In these examples, three separate tabulations using the 1997 Standards are shown: (a) race: mutually exclusive race groups, including several multiple-race combinations; (b) race, any mention: race groups that are not mutually exclusive because each race category includes all persons who mention that race; and (c) Hispanic origin and race: detailed race and Hispanic origin with a multiple-race total category. Where applicable, comparison tabulations by race and Hispanic origin are shown based on the 1977 Standards. Because there are more race groups with the 1997 Standards, the sample size of each race group under the 1997 Standards is slightly smaller than the sample size under the 1977 Standards. Only those few multiple-race groups with sufficient numbers of observations to meet standards of statistical reliability are shown. These tables also illustrate changes in labels and group categories resulting from the 1997 Standards. The race designation “black” was changed to “black or African American,” and the ethnicity designation “Hispanic” was changed to “Hispanic or Latino.”

Survey data included in *Health, United States*, other than NHIS, the National Survey of Drug Use and Health (NSDUH), and the National Health and Nutrition Examination Survey (NHANES), generally do not permit tabulation of estimates for the detailed race and ethnicity categories shown in Tables IX and X, either because race data based on the 1997 Standards categories are not yet available or because there are insufficient numbers of observations in certain subpopulation groups to meet statistical reliability or confidentiality requirements.

To improve the quality of data on ethnicity and race in NHIS, hot-deck imputation of selected race and ethnicity variables was done for the first time in the 2000 NHIS and continued to be used for subsequent data years. Starting with 2003 data, records for persons for whom “other race” was the only race response were treated as having missing data on race and were added to the pool of records for which selected race and ethnicity variables were imputed. Prior to the 2000 NHIS, a crude imputation method that assigned a race to persons with missing values for the variable MAINRACE (the respondent’s classification of the race he or she most identified with) was used. Under these procedures, if an observed race was recorded by the interviewer, it was used to code a race value. If there was no observed race value, all persons who had a missing value for MAINRACE and were identified as Hispanic on the Hispanic-origin question were coded as white. In all

other cases, non-Hispanic persons were coded as “other race.” Additional information on the NHIS methodology for imputing race and ethnicity is available from the survey documentation at: [https://www.cdc.gov/nchs/nhis/quest\\_data\\_related\\_1997\\_forward.htm](https://www.cdc.gov/nchs/nhis/quest_data_related_1997_forward.htm), and from the NHIS race and Hispanic-origin home page at: <https://www.cdc.gov/nchs/nhis/rhoi.htm>.

*National Survey on Drug Use and Health (NSDUH)*—Race-specific estimates based on NSDUH are tabulated using the 1997 Standards. Estimates in the NSDUH trend table begin with data year 2002. Estimates for specific race groups are shown when they meet requirements for statistical reliability and confidentiality. The race categories white only, black or African American only, American Indian or Alaska Native only, Asian only, and Native Hawaiian or Other Pacific Islander only include persons who reported only one racial group; the category 2 or more races includes persons who reported more than one of the five racial groups in the 1997 Standards or one of the five racial groups and “some other race.” (Also see Appendix II, Hispanic origin; and Appendix I, Population Census and Population Estimates.)

**Rate**—A measure of some event, disease, or condition in relation to a unit of population, along with some specification of time. (Also see Appendix II, Age adjustment; Population.)

### **Birth and related rates**

*Birth rate*—Calculated by dividing the number of live births in a population in a year by the midyear resident population. For census years, rates are based on unrounded census counts of the resident population as of April 1. For the noncensus years 1981–1989, rates are based on the midyear resident population, rounded to thousands. Rounded population estimates for 5-year age groups are calculated by summing unrounded population estimates before rounding to thousands. Starting in 1991, rates are based on unrounded national population estimates. Birth rates for 1991–1999 were revised based on the 1990 and 2000 Censuses. Birth rates for 2001–2009 were revised based on the 2000 and 2010 Censuses. Birth rates for 2011 and subsequent years were computed using 2010-based postcensal estimates. The population estimates have been provided by the U.S. Census Bureau and have been modified to be consistent with OMB racial categories as of 1977 and historical categories for birth data. Beginning in 1997, the birth rate for the maternal age group 45–49 includes data for mothers aged 50–54 in the numerator and is based on the population of women aged 45–49 in the denominator. Birth rates are expressed as the number of live births per 1,000 population. The rate may be restricted to births to women of specific age, race, marital status, or geographic location (specific rate), or it may be related to the entire population (crude rate).

*Fertility rate*—Total number of live births, regardless of the age of the mother, per 1,000 women of reproductive age (aged 15–44). Beginning in 1997, the birth rate for the maternal age group 45–49 includes data for mothers aged 50–54 in the numerator and is based on the population of women aged 45–49 in the denominator.

## Death and related rates

*Death rate*—Calculated by dividing the number of deaths in a population in a year by the midyear resident population. For census years, rates are based on unrounded census counts of the resident population as of April 1. For the noncensus years 1981–1989, rates are based on the midyear resident population, rounded to thousands. Rounded population estimates for 10-year age groups are calculated by summing unrounded population estimates before rounding to thousands. Starting in 1991, rates are based on unrounded national population estimates. Rates for the Hispanic and non-Hispanic white populations in each year are based on unrounded state population estimates for states in the Hispanic reporting area. Death rates are expressed as the number of deaths per 100,000 resident population. The rate may be restricted to deaths in specific age, race, sex, or geographic groups or from specific causes of death (specific rate), or it may be related to the entire population (crude rate). (Also see [Appendix I](#), Population Census and Population Estimates.)

*Birth cohort infant mortality rates*—Based on the birth cohort linked birth and infant death files and computed as the number of deaths under age 1 year to members of the birth cohort, divided by the number of live births, times 1,000. (Also see [Appendix II](#), Birth cohort.)

*Fetal mortality rate*—Number of fetal deaths with stated or presumed gestation of 20 weeks or more, divided by the sum of live births plus fetal deaths, times 1,000.

*Infant mortality rate*—Based on period files of linked birth and infant death data and calculated by dividing the number of infant deaths during a calendar year by the number of live births reported in the same year. It is expressed as the number of infant deaths per 1,000 live births. Neonatal mortality rate is the number of deaths among infants under age 28 days per 1,000 live births. Postneonatal mortality rate is the number of infant deaths that occur between 28 days to under 1 year after birth, per 1,000 live births. (Also see [Appendix II](#), Infant death.)

*Late fetal mortality rate*—Number of fetal deaths with stated or presumed gestation of 28 weeks or more, divided by the sum of live births plus late fetal deaths, times 1,000. (Also see [Appendix II](#), Gestation.)

*Perinatal mortality rates and ratios*—Relate to the period surrounding the birth event. Rates and ratios are based on events reported in a calendar year. Although several different perinatal mortality definitions exist, the

perinatal definition used in *Health, United States* (and used most commonly for international comparisons) is the sum of late fetal deaths at 28 weeks of gestation or more plus infant deaths within 7 days of birth, divided by the sum of live births plus late fetal deaths, times 1,000. The perinatal mortality ratio is the sum of late fetal deaths plus infant deaths within 7 days of birth, divided by the number of live births, times 1,000.

## Visit rate

*Visit rate*—A basic measure of service utilization for event-based data. Examples of events include physician office visits with drugs provided, or hospital discharges. In the visit rate calculation, the numerator is the number of estimated events, and the denominator is the corresponding U.S. population estimate for those who possibly could have had events during a given period of time. The interpretation is that for every person in the population there were, on average,  $x$  events. It does not mean that  $x$  persons in the population had events, because some persons in the population had no events while others had multiple events. The only exception is when an event can occur just once for a person (e.g., if an appendectomy is performed during a hospital stay). The visit rate is best used to compare utilization across various subgroups of interest, such as age or race groups or geographic regions.

**Region**—See [Appendix II](#), Geographic region.

**Registered hospital**—See [Appendix II](#), Hospital.

**Registration area**—The United States has separate registration areas for birth, death, marriage, and divorce statistics. In general, registration areas correspond to states and include two separate registration areas for the District of Columbia (D.C.) and New York City. The term “reporting area” may be used interchangeably with the term “registration area.” All registration areas have adopted laws that require registration of births and deaths and the reporting of fetal deaths. It is believed that more than 99% of births and deaths occurring in this country are registered.

The death registration area was established in 1900 with 10 states and D.C., and the birth registration area was established in 1915, also with 10 states and D.C. Beginning in 1933, all states were included in the birth and death registration areas. The specific states added year by year are shown in: Hetzel AM. History and organization of the vital statistics system. National Center for Health Statistics. 1997. Available from: <https://www.cdc.gov/nchs/data/misc/usvss.pdf>. Currently, Puerto Rico, the U.S. Virgin Islands, and Guam each constitute a separate registration area, although their data are not included in statistical tabulations of U.S. resident data. (Also see [Appendix II](#), Reporting area.)

**Relative standard error (RSE)**—A measure of an estimate’s reliability. The RSE of an estimate is obtained by dividing the standard error of the estimate,  $SE(r)$ , by the estimate itself,  $r$ . This quantity is expressed as a percentage

of the estimate and is calculated as follows:

$$RSE = 100 \times [SE(r)/(r)]$$

Estimates with large RSEs are considered unreliable. In *Health, United States*, most statistics with large RSEs are preceded by an asterisk or are not presented. The criteria for evaluating RSEs is discussed in the footnotes accompanying each table. Starting with *Health, United States, 2017*, a multistep National Center for Health Statistics data presentation standard for proportions has replaced RSE to identify unreliable estimates of proportions from the 2015–2016 and 2013–2016 estimates from National Health and Nutrition Examination Surveys and the 2016 National Health Interview Survey. In the Chartbook figures and data tables, all estimates are presented in accordance with these standards. (Also see [Appendix II](#), Data presentation standard for proportions.)

**Reporting area**—In the National Vital Statistics System, the reporting area for basic items on the birth and death certificates such as age, race, and sex is based on data from residents of all 50 states in the United States, the District of Columbia, and New York City. The term “reporting area” may be used interchangeably with the term “registration area.” (Also see [Appendix II](#), Registration area; and [Appendix I](#), National Vital Statistics System [NVSS].)

**Resident population**—See [Appendix II](#), Population.

**Self-assessment of health**—See [Appendix II](#), Health status, respondent-assessed.

**Short-stay hospital**—See [Appendix II](#), Hospital.

**Smoker**—See [Appendix II](#), Tobacco use.

**Special hospital**—See [Appendix II](#), Hospital.

**Substance use**—Refers to the use of selected substances, including alcohol, tobacco products, drugs, inhalants, and other substances that can be consumed, inhaled, injected, or otherwise absorbed into the body with possible dependence and other detrimental effects. (Also see [Appendix II](#), Alcohol consumption; Illicit drug use; Tobacco use.)

**National Survey on Drug Use and Health (NSDUH)**—Conducts in-person, computer-assisted interviews of a sample of individuals aged 12 and over at their place of residence. For illicit drug use, alcohol use, and tobacco use, information is collected about use in the lifetime, past year, and past month. However, only estimates of use in the past month are presented in *Health, United States*. For illicit drug use, respondents in NSDUH are asked about use of marijuana or hashish, cocaine (including crack), inhalants, hallucinogens, heroin, and misuse of prescription-type psychotherapeutic drugs (pain relievers, tranquilizers, stimulants, and sedatives). A series of questions is asked about each substance: “Have you ever, even once, used [substance]?” and “How long has it been since you last used [substance]?” Numerous probes and checks are

included in the computer-assisted interview system. Starting in 2013, information about marijuana use that was recommended by a doctor or other health care professional has been collected; however, any reported marijuana use is classified as illicit drug use. Starting in 2015, changes in measurement for 7 of the 10 illicit drug categories—hallucinogens, inhalants, methamphetamine, and the misuse of prescription pain relievers, tranquilizers, stimulants, and sedatives—may affect their comparability with the estimates of these illicit drugs and any illicit drug use produced prior to 2015. Additionally, prescription psychotherapeutic subtypes were revised in 2016; therefore, data on codeine products prior to 2016 cannot be compared with those from 2016 onward. (Also see [Appendix I](#), National Survey on Drug Use and Health [NSDUH].)

**Tobacco use**—Tobacco products encompass varieties of products including: cigarettes, cigarette tobacco, roll-your-own tobacco, smokeless tobacco, electronic cigarettes, cigars, hookahs, pipe tobacco, nicotine gels, and dissolvables. Vapes, vaporizers, vape pens, hookah pens, electronic cigarettes (e-cigarettes or e-cigs), and e-pipes are some of the many terms used to describe electronic nicotine delivery systems (ENDS). ENDS are battery-powered tobacco products that typically deliver nicotine in the form of an aerosol. Cigars include premium cigars, little filtered cigars, and cigarillos. Use of tobacco products is measured differently by the data systems used in *Health, United States*.

**National Health Interview Survey (NHIS)**—Information about cigarette smoking is obtained for adults aged 18 and over. From 1965 through 1990, the basic cigarette smoking status questions consisted of two parts: (1) “Have you smoked at least 100 cigarettes during your entire life?” (2) If yes, “Do you smoke cigarettes now?”

In 1991, a transition to a new measure of smoking status was initiated. For the first time, NHIS distinguished smokers who smoked daily from those who smoked less often than daily. Respondents were first asked, “Have you smoked at least 100 cigarettes in your entire life?” If yes, “Do you smoke cigarettes now?” To those who said “yes” to the question about current cigarette smoking, the question was asked, “Do you smoke cigarettes every day or some days?” For those who said “no” to the current smoking status question, the question was asked, “Do you smoke cigarettes ‘not at all’ or ‘some days’?” This additional follow-up resulted in the classification of persons as “someday smokers” who would otherwise have been considered former smokers, since they initially said that they did not smoke now.

In 1992, the transition to the current set of questions occurred. The NHIS Cancer Supplement consisted of two separate questionnaires, each asked of a representative sample of the U.S. civilian noninstitutionalized adult population aged 18 years and over. The Cancer Control questionnaire contained the same set of questions asked in 1991, while the Cancer Epidemiology questionnaire

asked “Have you smoked at least 100 cigarettes in your entire life?” If yes, “Do you now smoke cigarettes every day, some days, or not at all?” The inclusion of both sets of questions in the same year allowed for evaluation of the impact of the question change on population prevalence. The revised current smoking status question was estimated to have resulted in an increase in smoking prevalence of about 1% as a result of capturing cigarette smoking among persons who would otherwise have been classified as nonsmokers with the original question. The estimates for 1992 shown in *Health, United States* combine data collected using both the traditional and revised questions. Estimates for 1993 and beyond use the revised questions.

In 1993–1995, estimates of cigarette smoking prevalence were based on a half-sample. Smoking data were not collected in 1996. Starting in 1997, smoking data were collected in the Sample Adult questionnaire. Starting in 2014, questions were added to NHIS on the use of e-cigarettes; however, estimates of e-cigarette use from NHIS are not presented in *Health, United States*. For more information on survey methodology and sample sizes pertaining to NHIS cigarette smoking data, see the NHIS “Adult Tobacco Use Information” website at: <https://www.cdc.gov/nchs/nhis/tobacco.htm>.

**National Survey on Drug Use and Health (NSDUH)**—Conducts in-person, computer-assisted interviews of a sample of individuals aged 12 and over at their place of residence. Information on current cigarette smoking is obtained based on the following question: “Now think about the past 30 days—that is, from [DATE] up to and including today. During the past 30 days, have you smoked part or all of a cigarette?”

To measure current use of any tobacco products, respondents were asked about the use of each tobacco product on 1 or more days in the past 30 days, including: smokeless tobacco (such as snuff, dip, chewing tobacco, or snus), cigars, or pipe tobacco. Any amount of use reported in the past 30 days was classified as recent use of that tobacco product. Electronic cigarette use was not considered in the definition of current cigarette smoking or any use of tobacco products.

**National Youth Tobacco Survey (NYTS)**—An annual school-based survey of U.S. middle and high school students that collects data on tobacco use and tobacco-related attitudes, beliefs, and influences. Students in grades 6–12 were asked questions about the use of a variety of tobacco products on 1 or more days during the past 30 days. Tobacco products include: cigarettes; cigars, cigarillos, or little cigars; chewing tobacco, snuff, or dip; e-cigarettes; hookah or water pipe; roll-your-own cigarettes; pipe filled with tobacco (not water pipe); snus; dissolvable tobacco products; and bidis (small brown cigarettes wrapped in a leaf). Any amount of use reported in the past 30 days was classified as recent use of that tobacco product.

**Uninsured**—Broadly, persons are considered uninsured if they do not have coverage under private health insurance, Medicare, Medicaid, public assistance (through 1996), Children’s Health Insurance Program (CHIP), a state-sponsored or other government-sponsored plan or program, or a military health plan. Because of differences in methodology, question wording, and recall period, estimates from different sources may vary and are not directly comparable. For more information, see: U.S. Census Bureau. Health insurance measurement: Differences by data source. Available from: [https://www2.census.gov/programs-surveys/demo/visualizations/p60/257/health\\_insurance\\_measurement.pdf](https://www2.census.gov/programs-surveys/demo/visualizations/p60/257/health_insurance_measurement.pdf).

**National Health Interview Survey (NHIS)**—In NHIS, the uninsured are persons who do not have coverage under private health insurance, Medicare, Medicaid, public assistance (through 1996), CHIP, a state-sponsored health plan, other government-sponsored programs, or a military health plan. Persons with only Indian Health Service coverage are considered uninsured. Estimates for the uninsured are shown only for the population under age 65. Estimates of the percentage of persons who are uninsured based on NHIS may differ slightly from those based on the March Current Population Survey or the American Community Survey because of differences in survey questions, recall period, and other aspects of survey methodology.

Survey respondents may be covered by health insurance at the time of interview but may have experienced one or more lapses in coverage during the year prior to interview. Starting with *Health, United States, 2006*, NHIS estimates for people with health insurance coverage for all 12 months prior to interview, for those who were uninsured for any period up to 12 months, and for those who were uninsured for more than 12 months were added as stub variables to selected tables. (Also see [Appendix II](#), Health insurance coverage.)

**Vaccination**—The process of using a vaccine to stimulate the immune system to become protected against a disease. For more information about vaccines and vaccine-preventable diseases, see <https://www.vaccines.gov> or <https://www.cdc.gov/vaccines/schedules/index.html>.

The currently recommended childhood vaccination schedule includes vaccines that prevent infectious diseases including hepatitis A and B, rotavirus, diphtheria, tetanus toxoids, acellular pertussis (whooping cough), measles, mumps, rubella (German measles), polio, varicella (chicken pox), and some forms of meningitis (HIB), influenza, and pneumococcal disease.

In 2006, a quadrivalent vaccine that protected against the four types of human papillomavirus (HPV) that cause most cervical cancers and genital warts was approved by the Food and Drug Administration (FDA). The vaccine was recommended for females aged 11 and 12 and females aged 13–26 who had not yet been vaccinated or completed the vaccine series. In 2011, HPV vaccination also was

recommended for males aged 11 and 12. A new vaccine that protects against nine types of HPV that can cause cervical, vulvar, vaginal, and anal cancers, as well genital warts, was approved by the FDA in 2014 for both females and males. More information is available from: <https://www.cdc.gov/mmwr/volumes/65/wr/mm6549a5.htm>. In addition to HPV vaccination, adolescents aged 11–12 are recommended also to receive meningococcal vaccination.

In addition to keeping current with the vaccines listed above and annual influenza vaccination, some additional vaccinations are recommended for older adults, persons with specific health conditions, or health care workers who are likely to be exposed to infectious persons. For example, herpes zoster vaccination is recommended for adults aged 50 and over, and pneumococcal vaccination is recommended for adults aged 65 and over and persons with specific health conditions. For a full discussion of recommended vaccination schedules by age and population, see the Centers for Disease Control and Prevention's (CDC's) vaccination and immunization website at: <https://www.cdc.gov/vaccines/schedules/index.html>.