# APPENDICES

# Appendix A
# Data Sources

**Behavioral Risk Factor Surveillance System (BRFSS).** The BRFSS is a state-based system of health surveys that was established by the Centers for Disease Control and Prevention (CDC) to assess the prevalence of and trends in health-related behaviors in the non-institutionalized adult population aged 18 years and older. Data are collected monthly from a random telephone sample of adults living in households with landline telephones. Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. More than 350,000 adults are interviewed each year, making the BRFSS the largest telephone health survey in the world. Utah has participated continuously in the BRFSS since its inception in 1984.

The BRFSS questionnaire is modified each year by the CDC in collaboration with participating state agencies. The questionnaire has three parts. The first part is a core set of questions that is asked by all states. The second part consists of a series of topical modules developed by the CDC. States have the option of adding modules as they wish. The final part of the questionnaire consists of questions designed and administered by individual states to address issues of local concern. These have been revised annually in Utah to maximize the survey's ability to address the needs of Utah's health programs. Participants in the Utah BRFSS are asked about a wide variety of behaviors such as seat belt use, exercise, tobacco and alcohol consumption, and health services utilization.

Respondents from the BRFSS Core who report that they or their child has asthma are randomly selected to be called again to answer additional questions, known as the BRFSS Asthma Call-back Survey. The call-back survey contains approximately 100 asthma-specific questions and provides information on symptoms, medication use, number of asthma attacks, asthma education, environmental triggers, and missed school and work days. Participation in the BRFSS is completely anonymous and voluntary. Prior to analysis, BRFSS data are weighted so that the findings can be generalized to the Utah adult population.

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**Utah Emergency Department Encounter Database (EDED) and Utah Inpatient Hospital Discharge Database (HDDB)**. The EDED contains consolidated information on complete billing, medical codes, characteristics describing a patient, services received, and charges billed for each patient emergency department (ED) encounter. The Bureau of Emergency Medical Services/Office of Health Care Statistics receives quarterly emergency department encounter data from hospitals. The data are converted into a standardized format and validated through a process of automated editing and report verification. Each record is subjected to a series of edit checks for accuracy, consistency, completeness, and conformity with the definitions specified in the Utah Hospital Emergency Patient Encounter Data Submittal Manual. Records failing the edit check are returned to the data supplier for correction.

The HDDB contains consolidated information for complete billing, medical codes, characteristics describing a patient, services received, and charges billed for each inpatient hospital stay. The Office of Health Care Statistics (OHCS) receives quarterly discharge data from hospitals. The data are converted into a standardized format and validated using automated editing and report verification. Each record is subjected to a series of edits to check for accuracy, consistency, completeness, and conformity with the definitions specified in the Data Submittal Manual. Records failing the edit check are returned to the data supplier for correction.

Since the data source is billing forms, all visits or encounters have a diagnosis code. There is some difference of opinion regarding whether some providers emphasize diagnosis codes that yield higher reimbursements. The hospital and ED data are considered "administrative data" because they were created for use in billing and remittance of payment. As such, they were not constructed for public health surveillance purposes, and are weak in areas such as external causes of injury and race or ethnicity. In general, however, they are extremely valuable and reasonably complete and valid.

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**Utah Death Certificate Database.** Utah requires that death certificates be filed by funeral directors. Funeral directors obtain demographic information from an informant, usually a close family member of the deceased. The cause of death is certified by the decedent's physician or the physician who attended the death. Accidental and suspicious deaths are certified by the Medical Examiner. Death Certificate data are assessed for completeness and consistency. The Utah Department of Health Office of Vital Records and Statistics (OVRS) conducts annual training for funeral directors and local registrars. When death certificates are received, the cause of death literals are computer-entered by personnel at the OVRS. The data are then shipped to the National Center for Health Statistics (NCHS), where they are machine-coded into ICD-10 codes. NCHS returns the ICD-10 codes to OVRS and the records are updated.

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**Utah School Health Profiles.** The School Health Profiles (Profiles) assist states and local education and health agencies in monitoring and assessing characteristics of: school health education; physical education; school health policies related to HIV infection/AIDS; tobacco-use prevention; nutrition; asthma management activities; and; family and community involvement in school health programs. Data from Profiles can be used to improve school health programs.

Two questionnaires are used to collect data—one for school principals and one for lead health education teachers. The Profiles questionnaires were developed by the Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention in collaboration with representatives of state, local, and territorial departments of health and education. Because the response rates for these surveys were ≥ 70%, the results are weighted and are representative of all regular public elementary and secondary schools in Utah.

# Appendix B
# Technical Notes and Methodology

## Report Terminology

### Age-adjustment

Crude rates (or crude prevalence estimates) are valuable for comparing similar populations of different sizes, but the word "similar" is a key concept, because crude rates can be misleading when comparing rates for populations with different age compositions. The crude mortality rate for a population depends on the mortality rate in each age group as well as the proportion of people in each age group. For instance, the crude rate for most causes of death will be higher in populations with a large proportion of elderly individuals and lower in populations with a large proportion of young individuals. An age-adjusted rate may be used to compare mortality or disease risk in two populations with different age compositions.

An adjusted rate is an overall summary measure that helps control for age differences between populations. When comparing across geographic areas, some method of age-adjusting is typically used to control for area-to-area differences in health events that can be explained by different age distributions in the area populations. For example, an area with an older population will have higher crude death rates for cancer, even though its exposure levels and cancer rates within specific age groups may be the same as those in other areas. One might incorrectly attribute the high cancer rates to some characteristic of the area other than age. Age-adjusted rates control for age effects, allowing better comparability of rates across areas. Age-adjustment may also be used to control for age effects when comparing across several years of data, as the age distribution of the population changes over time.

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Calculating age-adjusted rates using "direct age standardization" is the same as calculating a weighted average. It adjusts the age-specific rates observed in a given population (such as a county or ethnic group) to the age distribution of a standard population (Lilienfeld & Stolley, 1994).

Figures 6 and 7 were age-adjusted using 3 age groups. Figures 4, 8, 9, and 10 and Table 1 were age-adjusted using 8 age groups. Figures 51 and 53 were age-adjusted using 11 age groups.

**Confidence Interval**

Observed health statistics (counts, rates, percentages, etc.) from sample data are not always a true reflection of the health status in the general population. Health data gathered can vary from sample to sample or from year to year, and for this reason confidence intervals are used to estimate the true underlying risk of a health problem within a community. A 95% confidence interval is the range within we can be 95% confident that the estimate reflects the true health status we are trying to convey for a given population. Confidence intervals are included within many of the graphs and tables throughout this report and should be interpreted accordingly.

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**Prevalence**

Prevalence can be interpreted as the percentage of the population with the given health condition of interest. The numerator includes the count of those with the condition and the denominator includes a count of the total population of interest, resulting in a proportion.

A. Crude Prevalence

In general, prevalence is called "crude prevalence" if it has not been adjusted for the age and sex composition of a population.

B. Age- and Sex-specific Prevalence

An age- or sex-specific prevalence estimate is calculated by dividing the total number of individuals with a health condition for the specific age group of interest by the total population in that age or sex group.

**Rates**

The count alone will be less useful when comparing populations of unequal size. Knowing population sizes is useful, but computing a rate will allow direct comparison between similar populations. A rate is a fraction that typically has four components:

1. A specified time period.

2. The numerator, which is the number of people for whom an event occurred during a given period of time.

3. The denominator, which is the total number of people in the population at risk for the same period of time. This is also referred to as the "person-years at risk."

4. A constant. The result of the fraction is usually multiplied by some constant (such as 100,000) to make the number more legible.

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A. Crude Rates

In general, a rate is called a "crude rate" if it has not been adjusted for the age and sex composition of a population.

B. Age- and Sex-specific Rates

An age- or sex-specific rate is calculated by dividing the total number of health events for the specific age or sex group of interest by the total population in that age group.

**Statistical Significance**

Because health data can vary from year to year or from sample to sample, 95% confidence intervals are used to estimate the true underlying risk of a health problem within a community (see above). At times the prevalence or rate estimates for two different groups can appear to be different from one another based on the point estimates alone, when in reality, the difference may be due to sampling variation rather than true differences in the underlying populations. Prevalence estimates or rates are considered to be statistically different from one another if their confidence intervals do not overlap, which suggests true differences in the underlying populations.