Appendix F:

Methodology

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Questionnaire

The BRFSS questionnaire is modified each year by the Centers for Disease Control and Prevention (CDC) in collaboration with participating states and territories. The questionnaire has three sections. One is a core set of questions that is asked by all states and territories. The second consists of a series of topical modules developed by the CDC. States have the option of adding modules as they wish. The final section of the questionnaire consists of questions designed and administered by individual states to address issues of local concern (state-added questions).

Sampling design

In the years 2001–2005, the Utah BRFSS telephone sample was disproportionately stratified by Utah's 12 health districts. Rural health districts with a comparatively lower population were sampled at a higher rate than urban health districts with larger populations. This over-sampling of lower population districts allowed for the collection of enough observations to produce reliable estimates within each district.

Within each health district a disproportionate stratified sampling (DSS) design was used. In years 2001 and 2002 in the DSS design, all the telephone numbers in each health district were stratified by telephone blocks. A block consists of 100 phone numbers that differ by only their last 2 digits (e.g. (801)-538-1100 to (801)-538-1199). One-plus blocks (high-density strata) include 100 consecutive telephone numbers containing at least one published household telephone number. Zero-blocks (low-density strata) consist of 100 consecutive telephone numbers containing no published household telephone numbers. Theoretically, there should be no published residential numbers in zero blocks, but unpublished numbers may exist. Zero blocks were sampled so that no individuals would be systemically excluded from the BRFSS. Both one-plus and zero-block numbers were randomly sampled from each health district, but at a disproportionate rate of 4:1, respectively. Beginning with the 2003 data year, zero-block numbers were not included in the sample frame.[49] In the DSS design since 2003, telephone numbers were drawn from two strata (lists) that are based on the presumed density of known telephone household numbers. In this most recent DSS design, telephone numbers are classified into two strata that are either high density (listed one-plus block telephone numbers) or medium density (not listed one-plus block numbers). High density versus medium density numbers are sampled at a rate of 1.5 to 1, respectively.

The monthly number of telephone numbers sampled from each health district is routinely tallied to ensure a target number of completed interviews each month in each district. Rural health districts were over-sampled to obtain at least 500 interviews in three years per health district. To facilitate analysis of the Utah BRFSS data by small area, a state-added question was included to collect the respondent's ZIP code. Combined 2001–2002 data were analyzed to check the number of completed interviews in the small areas. Completes ranged from 36 to 505 surveys in each small area during the two-year period. The highest number of completes were in small areas that are single county rural health districts, as those had been over-sampled. The smallest number of completes were in some of the small areas in the four urban, Wasatch Front health districts (Weber-Morgan, Davis County, Salt Lake Valley and Utah County). To compensate, sample size was increased in the four health districts along the Wasatch Front. There was no change in how the sample was stratified within those districts, however, the sampling proportion was increased in an effort to obtain at least 100 completed interviews in each small area with three years of data.

Once a residence was successfully contacted, individual respondents were randomly selected from all adults aged 18 and older living in the household. The selected adult, if willing, was then interviewed in accordance with the BRFSS protocol.

Data collection

Interviews were conducted monthly from the Utah Department of Health (UDOH) Survey Center by professional interviewers employed by the UDOH. The Survey Center uses a computer-assisted telephone interview-

ing (CATI) system to record respondent answers to the survey directly to a computerized database. The system is programmed to help ensure accurate data entry. The interviews were conducted during daytime and evening hours on weekdays and during daytime hours on Saturday to ensure that selected respondents had ample opportunity to complete the survey. Fifteen attempts were made to reach a phone number at different times of the day and on the weekend. Selected respondents were given the opportunity to schedule a time to be called in order to complete the interview. Interviews are routinely monitored to ensure adherence to strict BRFSS protocol. Monitoring is done electronically so that both the interviewer and respondent can be heard, and the computer screen can be observed to make sure responses are entered correctly without the interviewer being aware that he or she is being monitored. The overall response rate during the period was about 67%.

Data analysis

Sampling error: The BRFSS data were gathered from a sample of the Utah adult population. Sampling error refers to random variation that occurs because only a subset of the entire population is sampled and used to estimate the finding for the entire population. It is often called "margin of error" in popular use. In this report, sampling error has been expressed as **confidence interval bounds**. The 95% confidence interval indicates the range of values within which the statistic would fall 95% of the time if the researcher were to calculate the statistic from an infinite number of samples of the same size drawn from the same base population. The bar graphs of the age-adjusted prevalence estimates in this report include a line showing the estimated confidence intervals around the percentage estimates.

Non-sampling error: Sources of non-sampling error include idiosyncratic interpretation of survey questions by respondents, variations in interviewer technique, household and item non-response to questions and coding errors. Respondents may have the tendency to under report behaviors that are undesirable, unhealthy, or illegal (e.g., drinking and driving). They may over report desirable behaviors. The accuracy of self-reported information is also affected by the ability of respondents to fully recall past behaviors or health screening results. Unit non-response is when the person chosen for the sample refuses to complete the survey. Non-response rates in the BRFSS have increased in recent years. Conversely, a commonly used measure of the response rate known as the CASRO (Council of American Survey Research Organizations) rate has decreased over time. The Utah BRFSS CASRO response rate ranged from 70.6% to 63.2% between 2001–2005 with a generally decreasing trend in those years.

Weighting: Data were weighted to account for differences in the probability of section (e.g., the number of adults in a household). Post-stratification weighting based upon population estimates of adults by age categories and sex in Utah for the years 2001–2005 was used to ensure that the results more closely reflected the adult population of Utah.

Prevalence estimates: Respondents who answered "Don't know/Not sure" or refused to answer were excluded from the calculation of these estimates. The SAS® statistical package with SAS-Callable SUDAAN® computer software was used to compute prevalence estimates (both crude and age-adjusted) and associated 95% confidence intervals using sample weights provided by the CDC. SUDAAN software takes into account the complex BRFSS sample design in calculating unbiased standard errors for the confidence interval calculations.

Age-adjusted data: Many of the BRFSS measures vary by age. Therefore, the data were age adjusted to the 2000 U.S. standard population to control for differences due only to differences in the age composition of the small areas, health districts and the state as a whole. This adjustment allowed comparison between small areas, local health districts, and the state rate. Percentages for the small areas and local health districts were considered different from the state percentage if their 95% confidence intervals did not include the state percentage. In the report, these differences are represented on the maps of Utah's small areas for each measure. (These age-adjusted rates are useful for comparison purposes only, not to measure absolute magnitude. The actual numer-

ical value of an age-adjusted rate is dependent on the standard population used and, therefore, has no intrinsic meaning. To compare absolute magnitude, actual numbers and crude rates must be used.)

Population count estimates: Crude percentage estimates were applied to 2003 population counts to derive an estimate for the total number of persons in the U.S., Utah and in each of Utah's 61 small areas to whom the measure probably applied. The total 2003 population estimates for the U.S. were taken from the U.S. Census http://www.census.gov/popest/national/asrh/NC-EST2005-sa.html. The total population estimates for Utah and Utah's 12 local health districts were taken from the Governor's Office of Planning and Budget (GOPB) for year 2003. Population estimates for Utah's 61 small areas were derived by ZIP code estimates purchased from ESRI and then combined where necessary and adjusted to annual GOPB rates by county age and sex. Any demographic subgroup estimates for race, income, and education in Utah were derived from the BRFSS surveys using combined 2001–2005 data and using total population estimates from the GOPB.

Demographic profile information: Estimates of the population distribution for income, education, employment status, and marital status were derived from the BRFSS surveys from 2001–2005. The 2000 U.S. Census data were used for population distribution by race, Hispanic ethnicity, rural residence, children living in poverty, female head of household with no husband and children aged <18 years, females aged 25+ with a college degree, and adults aged 16+ in the work force. The population distributions by sex and age were obtained from the Governor's Office of Planning and Budget.

Small area analysis: In general, small areas yield rates with poor precision, that is, wide confidence intervals. The confidence interval provides information on the precision of an estimate and can be useful in identifying true differences between small areas and the state rate from sampling error. To minimize the sampling error, five years of the Utah BRFSS data were combined, and only measures that were asked at least three of the five years were included in order to have a large enough sample size for the measure in each small area.

For a detailed description of BRFSS methodology, see the BRFSS Surveillance Guide, an online version of the BRFSS Users Guide at http://www.cdc.gov/brfss/training.htm.