

TECHNICAL NOTES

Methodology

Background

The Behavior Risk Survey of Saline County was conducted at the request of the Saline County Alliance for a Healthy Community. This survey was based on methodology and survey content used by the Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a national data collection system, coordinated by the Centers for Disease Control and Prevention, designed to enable public health professionals to assess health risk factors known to contribute to or increase the risk of chronic and communicable disease, acute illness, injury, disability, and premature death. Kansas has conducted the statewide BRFSS every year since 1992.

Sampling

The telephone survey was conducted using a simple random digit dialing sampling method. Sampling was conducted by a commercial sample provider utilizing simple random digit dial (RDD) methods from one-plus blocks only (i.e., from blocks of one hundred telephone numbers in which there was at least one listed household). Pre-screening of the sample was conducted to eliminate businesses, institutions, and non-working numbers. Potential working telephone numbers were dialed during three separate calling periods (daytime, evening, and weekends) for a total of 15 call attempts before being replaced. Upon reaching a valid residential number, one household member aged 18 or older was randomly selected. If the selected respondent was not available, an appointment was made to call at a later date. If the selected respondent could not be reached during the survey calling period or refused to participate, that telephone number was replaced with another randomly selected number.

Because households were selected by random telephone number and no identifying information was solicited, all responses to this survey were anonymous. Between July 2000 and June 2001, 758 residents of Saline County were interviewed.

Data Collection

Residents of Saline County were interviewed by telephone using a standardized questionnaire prepared from BRFSS modules used by the Centers for Disease Control and Prevention (CDC) or developed specifically to meet the information needs of Saline County. The survey consisted, in part, of core modules used in all the counties participating in local BRFSS survey. Topics covered by the core modules were health status, health care access, hypertension awareness, cholesterol awareness, diabetes, exercise, seat belt use, tobacco use, smokeless tobacco use, demographics, breast and cervical cancer screening, adult immunization, HIV/AIDS, and quality of life. Additional questions were selected from optional modules available from CDC, previously used in the Kansas BRFSS, or developed for special surveys. These modules were parenting, mental health, health care utilization, health and health related absenteeism, prostate cancer screening, physical activity, respiratory conditions, firearms, health care coverage, violence and crime, and oral health.

Weighting Procedure

Weighting is a process by which the survey data are adjusted to account for unequal selection probability and to more accurately represent the population from which the sample was drawn. The weighting process for the survey data is based on the same formula which is used nationwide in the BRFSS. The responses of each person interviewed were assigned a weight which accounted for the number of telephone numbers in the household, the number of adults in the household, and the demographic distribution of the sample. By weighting the data, the responses were adjusted to compensate for the over-representation or under-representation of particular subgroups. Alterations in the weighting formulas were made to arrive at estimates for prevalence among households and among children in specific age groups. The following tables present a description of the sample before and after weighting of the data and compares age and sex breakdown to census estimates.

Demographic Characteristic	Unweighted Sample (%)	Weighted Sample (%)	Census Estimate (%)
Age			
18-24	8.5	12.8	12.7
25-34	15.8	17.5	17.2
35-44	21.4	21.6	21.3
45-54	20.5	17.0	18.1
55-64	12.7	11.8	11.7
65+	21.1	19.3	19.0
Sex			
Male	36.0	47.6	47.6
Female	64.0	52.4	52.4

Demographic Characteristics	Unweighted Sample (%)	Weighted Sample (%)
Education		
<HS Graduate	8.6	8.9
HS Diploma	33.2	34.8
Some College	33.1	32.6
College Graduate	25.0	23.6
Income		
\$0 - \$9,999	2.7	2.3
\$10,000 - \$19,999	11.9	10.1
\$20,000 - \$34,999	29.5	27.6
\$35,000 - \$49,999	27.3	28.4
\$50,000+	28.5	31.7

Demographic Characteristics	Unweighted Sample (%)	Weighted Sample (%)
Employment		
Employed for Wages	62.8	65.8
Self-Employed	6.5	6.3
Not Employed for Wages	10.1	9.5
Retired	20.6	18.3
Marital Status		
Married	53.2	61.2
Divorced/Separated	17.4	12.3
Widowed	12.9	8.8
Never Married/Unmarried Couple	16.5	17.7

Data Analysis

The charts and tables of the various risk factors presented in this document are broken down by age, gender, education level, income level, employment status, marital status, county, and various other factors likely to be associated with each specific risk factor. In the calculation of the percentage of the population at risk for specific health behaviors, respondents who indicated "don't know" or "refused" were not included. This causes some variation in sample size from question to question. When the results are generalized to the population, an assumption was made that the proportion of respondents at risk was the same for those with missing or unknown information as for those who provided adequate information. The percentage of missing or unknown responses was small for all questions except income for which 20% of responses were missing or unknown.

Data Reliability

Telephone interviewing has been demonstrated to be a reliable method for collecting behavioral risk data and can cost three to four times less than other interviewing methods such as mail-in interviews or face-to-face interviews. The BRFSS methodology has been utilized and evaluated by the CDC and other participating states since 1984. Content of survey questions, questionnaire design, data collection procedures, surveying techniques, and editing procedures have been thoroughly evaluated to maintain overall data quality and to lessen the potential for bias within the population sample.

Stratification of Data in Analysis

The complete demographic breakdown for selected risk factors can be found in the detailed tables section of this document. The breakdown of age, employment, marital status, and income varied according to the size of the stratified sample. In the profile chapters of the ten selected health issues, cell sizes were adjusted to above 20 individuals whenever possible. Smaller cell sizes were allowed in the tables in the appendices but the number of respondents is included to permit judgement about the stability of the proportion. Cell sizes smaller than 50 can provide unstable results, and cell sizes below 20 should be considered highly unstable (i.e., subject to fluctuation depending on the sample drawn.) The risk tables include a confidence interval for each percentage estimate. This represents a statistical test which should be used to assess the reliability of the estimate. This is discussed further in the introduction to those tables.

The education categories are comprised of those with less than a high school diploma, high school graduate, some college (i.e. technical or vocational school and partial college education with less than a four year degree), and college graduate (those who have a 4 year college degree and/or a postgraduate

degree). Annual household income categories are \$0-\$19,999, \$20,000-\$34,999, \$35,000-\$49,999, \$50,000+; however, it was sometimes necessary to collapse categories to obtain cell sizes over 20. The employment status category is comprised of people who are employed for wages, self-employed, retired, and those who are not employed (those out of work, homemakers, students, and those unable to work). Marital status is comprised of married, divorced or separated, widowed, and never married or unmarried couples.

Limitations

Sampling

The BRFSS survey samples the population using a technique which is discussed in the methodology section. Sampling yields results which are an estimate of the true answer for the entire population. The more persons that are interviewed, the greater the precision of the estimate. When the data are subdivided to look at sub-populations (e.g., an age subgroup) these estimates will be less precise; if the number of persons interviewed was small because the subgroup represents a small fraction of the population (e.g., diabetics less than 30 years old), the estimate may become too uncertain to be of value.

Because the survey is conducted by telephone, persons without telephones could not be reached. Since phone ownership is highly correlated to income, persons without a phone are more likely to be poor than persons with a telephone. This will potentially affect questions with responses that are highly dependent on income (e.g., health insurance) more than other questions. However, because phone ownership is high in Kansas (greater than 95%), it is unlikely that failing to reach these persons will substantially alter results.

Questionnaire Design and Administration

How a question is written and which questions preceded it in the questionnaire can influence responses in unpredictable ways. Not all the questions used in the survey have been tested to ensure that all persons understand the intended meaning. Those that come from modules created by the Centers for Disease Control and Prevention usually have been tested, while those in state modules may or may not have been tested, depending on the source of the question. Furthermore, not all questions are equally easy for respondents to answer. While it may be easy for a respondent to provide a personal opinion, it may be much harder to recall a past event (last mammogram) or provide factual information (household income).

Interviewers are trained and monitored to ensure that they administer the survey in a neutral voice and read the written question verbatim and without comment. Nonetheless, it is possible for the interviewer to bias the results through tone of voice or administration technique. Coding errors may also occur if the interviewer types in the wrong response to the question. In addition, the person being interviewed may alter his or her response to give the interviewer the most socially acceptable answer. This may be a problem especially for questions which may have a perceived stigma (e.g., HIV risk).

Response Rate

The CASRO rate, developed by the Council of American Survey Research Organizations is the total number of completed surveys divided by the total number of estimated households. For Saline County, the CASRO response rate was 52%. The upper bound response rate for the Saline survey was 59%. The upper bound formula* is based on the number of eligible households reached and the number of interviews completed. However, in addition to those persons who refused to answer questions, lack of response can also arise because household members were not available despite repeated call attempts, or household

members refuse to pick up the phone based on what they discern from caller ID. The bias from non-response cannot be removed; it is not possible to know if those who refused to respond would have answered the questions in approximately the same ways as those who responded.

Confounding and Causation

Relationships between risk factors and personal characteristics which are presented in this document are univariate (i.e., examine each risk factor in relationship to only one characteristic at a time); however, the complexity of health associations are not fully represented by examining single relationships. For example, an examination of heart disease and employment status might show a greater prevalence of heart disease among persons who are retired than among persons who are employed. However, persons who are retired are expected to have a greater average age than persons who are employed; consequently, this relationship might entirely disappear if we removed the effects of age. (If this were the case we would say that the relationship between heart disease and employment status was being confounded by age.)

Likewise, this document does not attempt to explain the causes of the health effects examined. For instance, BRFSS data might show a higher prevalence of heart disease among smokers, but one should not conclude from this that smoking causes heart disease. That smoking is indeed a causal factor for heart disease is apparent from a large body of scientific data, but that is not a conclusion that can be drawn from a cross-sectional survey such as this. Rather this is a “snapshot” of disease, risk factors, and population characteristics for adult residents of Saline County at a point in time.

* Upper bound response=number of complete interviews / (completes + refusals + terminations)