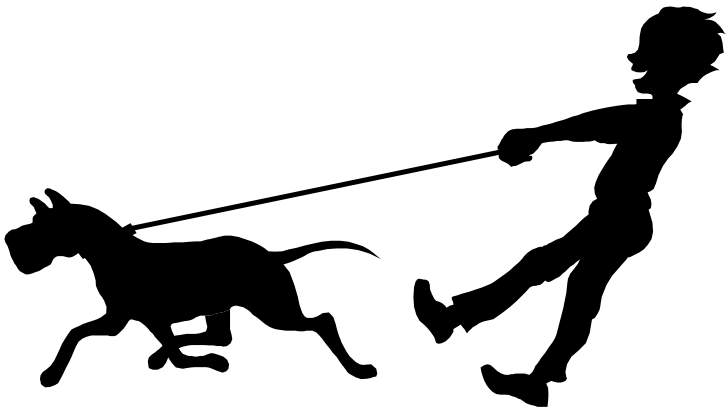
Appendix C. Technical Notes



General Technical Background to the 2000 Child Health Survey

Introduction

The purpose of this section is to provide the reader with a general methodological overview of the project. Persons interested in obtaining additional or more detailed information may contact:

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Sample Design

The *2000 Utah Child Health Survey* was conducted between November 11, 1999 and February 10, 2000. The statistical estimates in this report are based on *2000 Utah Child Health Survey* data.

The sample was a **statewide random digit dial (RDD) sample** designed to be representative of all Utah children through age 18. It is best described as a weighted probability sample of approximately 2,536 households that cover the entire state.

A **single stage, non-clustered, equal probability of selection telephone calling design** was used to generate telephone numbers. This method begins by building a *comprehensive database* consisting of all possible residential telephone working blocks in Utah. Those telephone blocks or area code designations assigned for business use were excluded. Telephone numbers were arranged sequentially into groups of 100 by selecting all telephone numbers within an area code and prefix, plus the first and second digits of the suffix (e.g., 801-538-10XX represents a group that includes all 100 phone numbers between 801-538-1000 and 801-538-1099). Each group of 100 telephone numbers was classified as either high density (at least three residential listings) or low density (less than three listed residential phone numbers in the group). All low density groups are removed, and high density groups are retained. Telephone numbers are randomly selected from the list of all possible phone numbers in high-density groups. This sampling design ensures that both listed and unlisted phone numbers are included in the sample.

Once a household was contacted, the interviewer asked to speak with the adult (age 18 or older) in the household who knew the most about the health of all children in the household (most knowledgeable adult). This person was then asked to report on health topics for either all children in the household, one randomly-selected child in the household, or up to three children in the household with special health care needs, depending on the survey question.

Survey Data Collection

The Utah Department of Health contracted with Pegus Research, Incorporated to collect the survey data. Pegus programmed the telephone survey instrument into a **computer-assisted telephone interviewing (CATI) software program,** called Ci3. Interviews were conducted by trained interviewers in a supervised environment from a single site. Interviews were conducted in Spanish when appropriate.

Computer-assisted telephone interviewing was chosen as the method of data collection for several reasons. First, it yields higher response rates than mail survey methods, thus resulting in a more representative sample and reducing the amount of bias resulting from nonresponse. Second, it helps reduce non-sampling error by standardizing the data collection process. Data-entry errors are reduced because interviewers are not allowed to enter non-valid codes. It was also efficient because it allowed interviewers to enter responses directly into a computer file, eliminating the need for a separate data entry process.

The survey questionnaire consisted of three sections. Section 1 asked the respondent for information on *every child* in the household. It included questions on the age, sex, and first name or initial of each child living in the household. It also included the Foundation for Accountability (FACCT) Living With Illness draft questionnaire. The FACCT questionnaire is designed to identify Children with Special Health Care Needs. Although the questionnaire was not in its final version in time for the 2000 Utah Child Health Survey, we were able to use a near-final draft. The instrument included questions on ten health problems or conditions: 1) use of prescription medications, 2) needs more care than most children, 3) restricted activity, 4) physical/speech/other therapy, 5) mental health problems, 6) durable medical equipment / special equipment, 7) life-threatening allergies, 8) special diet, 9) IEP (Individualized Education Plan, and special education), and 10) learning or behavioral difficulties. The child was considered to have special health care needs (SHCN) if any of these conditions were reported to have lasted, or were expected to last, for at least 12 months. Section 1 questions were asked of all children in the household (n=5,979).

For Section 2, the questions were asked about one randomly-selected (index) child in the household (n=2,536), plus up to two additional SHCN children (children with special health care needs, or CSHCN, n=730 additional children). Section 2 included questions on topics such as general health status, medical home, health insurance, health care utilization, problems with access to health care, and child activities and supervision. There were several questions that were asked only for SHCN children. The children with SHCN had known probabilities, and the sample was weighted to reflect the Utah population prior to data analysis.

Section 3 consisted of demographic questions about the household and the adult household members. The respondent was asked to report on such topics as the primary caregiver for the index child and the marital and employment status of adults in the household.

Response Rate

The interview process took place over a three-month period (from November 11, 1999 to February 10, 2000), and resulted in an estimated CASRO[1] response rate of 53%, with an upper-bound rate of 61%. If necessary, up to twelve telephone attempts were made to conduct the interview with each household.

1 The Council of American Survey Research Organizations (CASRO) response rate formula apportions dispositions with unknown eligibility status (ring-no-answer and busy) to dispositions representing eligible respondents in the same proportion as exists among all calls of known status.

Weighting and Estimation Methods

Post-survey weighting adjustments were made so that the Child Health Survey findings could be more accurately generalized to Utah's population.

The post-survey weighting adjustments weighted the sample to be proportionately consistent with the CSHCN, age, sex, geographic, and Hispanic status distribution of the 2000 Utah population. The CSHCN population for 2000 was estimated by the number of CSHCN among all children in the survey (n=5979). Utah population projections by sex, age groups, and county of residence were provided by the Utah Governor's Office of Planning and Budget (GOPB) (the projections used were those compiled in 2000). Estimates of Utah's Hispanic population for 2000 were derived by calculating the average annual rate of increase of Hispanic persons for each county using data from 1990 to 1998 Bureau of the Census reports, and then projecting those increases to 2000 GOPB population counts.

The post-survey weighting variables adjusted for the following factors:

1. The total **number of children in the household**.
2. The proportion of **CSHCN**.
3. The proportion of **Hispanic persons** in each area.
4. The proportion of persons by seven **geographic areas** (Salt Lake, Utah, Weber, Davis, other north, other south counties).
5. The **age and sex** distribution among Utah's population age 0-18.

Population count estimates. Once a percentage was calculated for a variable of interest (e.g., the percentage uninsured) using appropriately weighted survey data, a population count (N) to which the percentage applied was estimated. In some cases analyses referenced certain age or sex groups, Hispanic persons or combinations of Utah counties. These total population group counts were readily available from the sources described earlier. However, for other groups where population counts were largely unavailable (e.g., analyses that examined the distribution of CSHCN), the population counts were estimated. This was achieved by multiplying the appropriate 2000 population total for that group (from 2000 GOPB estimates) by a proportion obtained from a frequency distribution of survey data. For instance, to calculate a population count for CSHCN, the population of children age 0-17 from GOPB was multiplied by the percentage of CSHCN age 0-17 in the 2000 Utah Child Health Survey sample. Thus, any population count estimates not derived directly from existing age, sex, Hispanic status or county population estimates were derived from 2000 Child Health Survey data, and must be considered estimates.

Missing Values. Another consideration that affected the presentation of the population estimates in table format was the inclusion or exclusion of missing values ("don't know" and "refused to answer"). Population percentage estimates were calculated after removing the "don't know" and "refused to answer" responses from the denominator. This, in effect, assumed that persons who gave these answers were distributed identically on the variable of interest to those who gave a valid answer to that variable. For instance, among those who did not know whether they were insured, we assumed that 93.5% were insured and 6.5% were not insured — percentages identical to those found among the sample members who answered the question with a valid response.

Limitations and Other Special Considerations

Estimates developed from the sample may differ from the results of a complete census of all households in Utah due to two types of error, sampling and non-sampling error. Each type of error is present in estimates based on a survey sample. Good survey design and data collection techniques serve to minimize both sources of error.

Sampling error refers to random variation that occurs because only a subset of the entire population is sampled and used to estimate the finding in the entire population. It is often termed "margin of error" in popular use. Sampling error is expressed as a *confidence interval*. The 95% confidence interval (calculated as 1.96 times the standard error of a statistic) indicates the range of values within which the statistic would fall 95% of the time if the researcher were to calculate the statistic (e.g., a percentage) from an infinite number of samples of size=n drawn from the same base population. It is typically expressed as the "plus or minus" term, as in the following example:

> "The percentage of those polled who said they would vote for Al Gore was 52%, plus or minus 2%."

Because CSHCN were oversampled, and then the sample was weighted to reflect the Utah population, the Child Health Survey sample was considered a complex survey sample design. Estimating the sampling error for a complex survey design requires special statistical techniques. SUDAAN software (Research Triangle Institute) was chosen to estimate the standard errors of the survey estimates because it employs a statistical routine (Taylor-series expansion) that accounts for the complex survey design.

Graphs in this report include bars showing the estimated confidence interval around the survey estimate. In cases where the confidence interval was greater in magnitude than the estimate, the estimate was not given. Estimates were not presented where the sample denominators were less than n=50. Readers should note that we have always presented the confidence interval as though it were symmetric, that is, of equal value both above and below (plus and minus) the estimate. It is often the case, however, that a confidence interval will be nonsymmetric. This occurs when the distribution is positively or negatively skewed, such as when a percentage is close to 0% or 100%. However, because the software program we use provides only symmetric confidence intervals, we were unable to provide the asymmetric estimates without considerable additional effort.

Non-sampling error also exists in survey estimates. Sources of non-sampling error include idiosyncratic interpretation of survey questions by respondents, variations in interviewer technique, household non-response to questions, coding errors, and so forth. No specific efforts were made to quantify the magnitude of non-sampling error.

Comparability with other surveys is an issue with all survey data. Differences in survey design, survey questions, estimation procedures, the socio-demographic and economic context, and changes in the structure and financing of the health care delivery system may all affect comparison between the 2000 Utah Child Health Survey and other surveys, including those conducted by the U.S. Bureau of the Census, the Behavioral Risk Factor Surveillance System surveys, and Utah Department of Health, Health Status Surveys.

Telephone surveys exclude certain population segments from the sampling frame, including persons in group living quarters (e.g., military barracks, nursing homes) and households without telephones. At the time of the 1990 Decennial Census, only four percent of Utah households were without telephone service. Typically, telephone surveys are biased because telephone households under-represent lower income and certain minority populations. In addition, studies have shown that non-telephone households tend to have lower rates of health care utilization (especially dental care), poorer health habits and health status, and lower rates of health insurance coverage (Thornberry and Massey, 1988).

Despite these overall disparities between telephone and non-telephone households, new survey research (Keeter, 1995) suggests that a similarity exists between data from non-telephone households and telephone households that experienced an interruption in service over the past 12 months. This similarity exists because many, if not most, households currently without telephones did have service in the recent past, and will have service again in the future. Therefore, telephone surveys to be more representative of non-phone households than had previously been thought.