california health interview survey

Report Four

CHIS 2005 Methodology Series

Response Rates

CALIFORNIA HEALTH INTERVIEW SURVEY

CHIS 2005 METHODOLOGY SERIES

REPORT 4

RESPONSE RATES

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www.chis.ucla.edu

This report provides analysts with information about the response rates in CHIS 2005. The response rates are estimates of the percentage of sampled persons that participated in the survey, where the sample may be across the entire state, restricted to a county, or some other subgroup. To estimate response rates, the probability of sampling persons is taken into account. Thus, the response rates are weighted percentages of the number responding rather than simple unweighted percentages. Procedures used to increase the response rates are also discussed and, where possible, evaluated.

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PREFACE

Response Rates is the fourth in a series of methodological reports describing the 2005 California Health Interview Survey (CHIS 2005). The other reports are listed below.

CHIS is a collaborative project of the University of California, Los Angeles (UCLA) Center for Health Policy Research, the California Department of Health Services, and the Public Health Institute. Westat was responsible for the data collection and the preparation of five methodological reports from the 2005 survey. The survey examines public health and health care access issues in California. The 2005 survey is the third implementation of CHIS, the first and second implementations were done in 2001 and 2003. The plan is to monitor the health of Californians and examine changes over time by conducting periodic surveys in the future.

Methodological Reports

The first five methodological reports for the 2003 CHIS are as follows:

- Report 1: Sample Design;
- Report 2: Data Collection Methods;
- Report 3: Data Processing Procedures;
- Report 4: Response Rates; and
- Report 5: Weighting and Variance Estimation.

The reports are interrelated and contain many references to each other. For ease of presentation, the references are simply labeled by the report numbers given above.

This report describes the response rates from CHIS 2005. Response rates are the ratio of the number of units interviewed to the number of eligible sampled units. However, the computation of response rates for CHIS 2005 is involved because of the complexity of the survey. This report presents the rates and explains the rationale for the procedures used in computing the response rates from CHIS 2005.

The primary purpose of presenting these response rates is to provide information for analysts of the data. As a result, the response rates are also reported separately for the main analysis subgroups—adults (ages 18 and older), children (age less than 12), and adolescents (ages 12 to 17). The response rates are estimates of the percentage of sampled persons that participated in the survey, where the sample may be across the entire state, or it may be restricted to a county or another subgroup. To estimate response rates, the probability of sampling persons is taken into account. Thus, the response rates are weighted percentages of the number responding rather than simple unweighted percentages.

A secondary goal of this report is to examine procedures used in the survey to increase the response rates. The specific operational methods are described more completely in *CHIS 2005 Methodology Series: Report 2 – Data Collection Methods*. These methods are summarized briefly to provide some context for the examination in this report.

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1. CHIS 2005 DESIGN AND METHODOLOGY SUMMARY

1.1 Overview

The California Health Interview Survey (CHIS) is a population-based random-digit dial telephone survey of California's population conducted every other year since 2001. CHIS is the largest health survey conducted in any state and one of the largest health surveys in the nation. CHIS is based at the UCLA Center for Health Policy Research and is conducted in collaboration with the California Department of Health Services and the Public Health Institute. CHIS collects extensive information for all age groups on health status, health conditions, health-related behaviors, health insurance coverage, access to health care services, and other health and health related issues.

The sample is designed to meet and optimize two goals:

1. provide estimates for large- and medium-sized counties in the state, and for groups of the smallest counties (based on population size), and
2. provide statewide estimates for California's overall population, its major racial and ethnic groups, as well as several ethnic subgroups.

The CHIS sample is representative of California's non-institutionalized population living in households.

This series of reports describes the methods used in collecting data for CHIS 2005, the third CHIS data collection cycle, which was conducted between July 2005 and April 2006. The previous CHIS cycles (2001 and 2003) are described in similar series, available at http://www.chis.ucla.edu/methods_main.html.

CHIS data and results are used extensively by federal and State agencies, local public health agencies and organizations, advocacy and community organizations, other local agencies, hospitals, community clinics, health plans, foundations, and researchers. The data are widely used for analyses and publications to assess public health and health care needs, to develop and advocate policies to meet those needs, and to plan and budget health care coverage and services.

1.2 Sample Design Objectives

To achieve the sample design objectives stated above, CHIS employed a multi-stage sample design. First, the state was divided into 44 geographic sampling strata, including 41 single-county strata and three multi-county strata comprised of the 17 remaining counties. Second, within each geographic stratum, residential telephone numbers were selected through random-digit dial (RDD) sampling, and within each household, one adult (age 18 and over) respondent was randomly selected. In those households with adolescents (ages 12-17) and/or children (under age 12), one adolescent and one child were randomly selected; the adolescent was interviewed directly, and the adult most knowledgeable about the child's health completed the child interview.

Table 1-1 shows the 44 sampling strata for CHIS 2005. A sufficient number of adult interviews were allocated to each stratum to support the first sample design objective. The geographic stratification of the state was revised from the design used in previous CHIS cycles, increasing the number of individual counties from 33 to 41.

Table 1-1. California county and county group strata used in the CHIS 2005 sample design

1. Los Angeles	16. Sonoma	31. Napa
2. San Diego	17. Stanislaus	32. Kings
3. Orange	18. Santa Barbara	33. Madera
4. Santa Clara	19. Solano	34. Monterey
5. San Bernardino	20. Tulare	35. Humboldt
6. Riverside	21. Santa Cruz	36. Nevada
7. Alameda	22. Marin	37. Mendocino
8. Sacramento	23. San Luis Obispo	38. Sutter
9. Contra Costa	24. Placer	39. Yuba
10. Fresno	25. Merced	40. Lake
11. San Francisco	26. Butte	41. San Benito
12. Ventura	27. Shasta	42. Colusa, Glen, Tehama
13. San Mateo	28. Yolo	43. Plumas, Sierra, Siskiyou, Lassen, Modoc, Trinity, Del Norte
14. Kern	29. El Dorado	
15. San Joaquin	30. Imperial	44. Mariposa, Mono, Tuolumne, Alpine, Amador, Calaveras, Inyo

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

The samples in Marin, Humboldt, and Solano Counties were enhanced with additional funding. Additional samples were also selected statewide and in San Diego County to increase the number of child interviews; telephone numbers selected in these two additional samples were screened to identify households with children ages 0 to 11. All supplemental samples were implemented with and incorporated into the original statewide RDD sample.

The main RDD CHIS sample size is sufficient to accomplish the second objective. To increase the precision of estimates for Koreans and Vietnamese, areas with relatively high concentrations of these groups were sampled at higher rates. These geographically targeted oversamples were supplemented by telephone numbers associated with group-specific surnames drawn from listed telephone directories to further increase the sample size for Koreans and Vietnamese.

1.3 Data Collection

To capture the rich diversity of the California population, interviews were conducted in five languages: English, Spanish, Chinese (Mandarin and Cantonese dialects), Vietnamese, and Korean. These languages were chosen based on analysis of 2000 Census data to identify the languages that would cover the largest number of Californians in the CHIS sample that either did not speak English or did not speak English well enough to otherwise participate.

Westat, a private firm that specializes in statistical research and large-scale sample surveys, conducted the CHIS 2005 data collection under contract with the UCLA Center for Health Policy Research. Westat staff interviewed one randomly selected adult in each sampled household, and sampled one adolescent and one child if present in the household and the sampled adult was the parent or legal guardian. Up to three interviews could have been completed in each sampled household. In households with children where the sampled adult was not the screener respondent, children and adolescents could be sampled as part of the screening interview, and the extended child (and adolescent) interviews could be completed before the adult interview. This "child-first" procedure was new for CHIS 2005 and substantially increased the yield of child interviews. While numerous subsequent attempts were made to complete the adult interview, there were completed child and/or adolescent interviews in households for which an adult interview was not completed. Table 1-2 shows the number of completed adult, child, and adolescent interviews in CHIS 2005 by the type of sample (RDD or supplemental sample).

Table 1-2. Number of completed CHIS 2005 interviews by type of sample and instrument

Type of sample	Adult	Child	Adolescent
Total RDD + supplemental cases	43,020	11,358	4,029
RDD			
Base plus county supplements	41,074	9,605	3,739
Statewide child supplement	525	511	84
San Diego child supplement	1,143	1,160	186
Supplemental samples:			
Korean	199	60	14
Vietnamese	79	22	6

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

Interviews in all languages were administered using Westat's computer-assisted telephone interviewing (CATI) system. The average adult interview took 35 minutes to complete. The average child and adolescent interviews took 15 minutes and 20 minutes, respectively. For "child-first" interviews, additional household information asked as part of the child interview averaged almost 8 minutes. Interviews in non-English languages generally took longer to complete. Just over 10 percent of the adult interviews were completed in a language other than English, as were 18 percent of all child (parent proxy) interviews and 7 percent of all adolescent interviews.

Table 1-3 shows the major topic areas for each of the three survey instruments (adult, child, and adolescent).

1.4 Response Rates

The overall response rate for CHIS 2005 is a composite of the screener completion rate (i.e., success in introducing the survey to a household and randomly selecting an adult to be interviewed) and the extended interview completion rate (i.e., success in getting one or more selected persons to complete the extended interview). To maximize the response rate, especially at the screener stage, an advance letter in five languages was mailed to all sampled telephone numbers for which an address could be obtained from reverse directory services. An advance letter was mailed for approximately 67 percent of the sampled telephone numbers. In CHIS 2005, for the first time a $2 bill was included with the advance letter to promote cooperation. CHIS 2005 also included methodological experiments to test the effects on response of the incentive and different advance letter treatments.

Table 1-3. CHIS 2005 survey topic areas by instrument

Health status	**Adult**	**Teen**	**Child**
General health status, height and weight	✓	✓	✓
Days missed from school due to health problems	✓	✓	✓
Health conditions	**Adult**	**Teen**	**Child**
Asthma	✓	✓	✓
Diabetes	✓	✓	
Heart disease, high blood pressure, epilepsy	✓		
Physical disability/need for special equipment	✓		
Parental concerns with child development, attention deficit disorder (ADD)			✓
Mental health	**Adult**	**Teen**	**Child**
Mental health status	✓		✓
Perceived need, use of mental health services	✓		✓
Emotional functioning		✓	
Health behaviors	**Adult**	**Teen**	**Child**
Dietary intake	✓	✓	✓
Physical activity and exercise	✓	✓	✓
Walking for transportation and leisure	✓		
Sedentary time		✓	✓
Body image		✓	
Flu Shot	✓		
Alcohol and tobacco use	✓	✓	
Drug use		✓	
Sexual behavior, STD testing, birth control practices	✓	✓	
Women's health	**Adult**	**Teen**	**Child**
Pap test screening, mammography screening, hormone replacement therapy	✓		
Emergency contraception		✓	
Pregnancy status	✓	✓	
Cancer history and prevention	**Adult**	**Teen**	**Child**
Cancer history of respondent and family history	✓		
Colon cancer screening, prostrate cancer (PSA) test	✓		
Dental health	**Adult**	**Teen**	**Child**
Last dental visit			✓
Dental insurance coverage		✓	✓
Injury	**Adult**	**Teen**	**Child**
Serious injuries (frequency, cause)		✓	✓
Injury prevention behaviors (bike helmets, seatbelts)		✓	

Table 1-3. CHIS 2005 survey topic areas by instrument (Continued)

Food insecurity/hunger	**Adult**	**Teen**	**Child**
Availability of food in household over past 12 months	✓		
Food environment	**Adult**	**Teen**	**Child**
Quality of food stores in area, where does teen/child eat lunch and breakfast		✓	✓
School has vending machines		✓	
Access to and use of health care	**Adult**	**Teen**	**Child**
Usual source of care, visits to medical doctor	✓	✓	✓
Emergency room visits	✓	✓	✓
Delays in getting care (prescriptions, tests, treatment)	✓	✓	✓
Racial/ethnic discrimination in health care, MD discussed diet and exercise	✓		
Communication problems with doctor	✓	✓	✓
Ability and parental knowledge of teen contacting a doctor		✓	
Health insurance	**Adult**	**Teen**	**Child**
Current insurance coverage, spouse's coverage, who pays for coverage	✓	✓	✓
Health plan enrollment, characteristics of plan	✓	✓	✓
Whether employer offers coverage, respondent/spouse eligibility	✓		
Coverage over past 12 months	✓	✓	✓
Reasons for lack of insurance	✓	✓	✓
Public program eligibility	**Adult**	**Teen**	**Child**
Household poverty level	✓		
Program participation (TANF, CalWorks, Public Housing, Food Stamps, SSI, SSDI, WIC)	✓	✓	✓
Assets, alimony/child support/social security/pension	✓		
Eligible for Medi-Cal and healthy families	✓	✓	✓
Reason for Medi-Cal nonparticipation among potential eligibles	✓	✓	✓
Neighborhood and housing	**Adult**	**Teen**	**Child**
Neighborhood safety	✓	✓	
Home ownership, number of rooms, amount of mortgage/rent	✓		
Parental involvement/adult supervision	**Adult**	**Teen**	**Child**
Parental presence after school, parental knowledge of teen's activities		✓	
Child's activities with family			✓

Table 1-3. CHIS 2005 survey topic areas by instrument (Continued)

Child care and school attendance	Adult	Teen	Child
Current child care arrangements			✓
Paid child care	✓		
First 5 California: receipt of parent kit and attitudes towards preschool			✓
Preschool/school attendance, public/private school		✓	✓
Employment	**Adult**	**Teen**	**Child**
Employment status, spouse's employment status	✓		
Work in last week, industry and occupation	✓		
Hours worked at all jobs	✓	✓	
Income	**Adult**	**Teen**	**Child**
Respondent's and spouse's earnings last month before taxes	✓		
Household income (annual before taxes)	✓		
Number of persons supported by household income	✓		
Respondent characteristics	**Adult**	**Teen**	**Child**
Age, gender, height, weight, education	✓	✓	✓
Race and ethnicity	✓	✓	✓
Marital status	✓		
Sexual orientation	✓	✓	
Citizenship, immigration status, country of birth, length of time in U.S., languages spoken at home, English language proficiency	✓	✓	✓

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

The CHIS 2005 screener completion rate was 49.8 percent and was higher for households that were sent the advance letter. The extended interview completion rate varied across the adult, child and adolescent interviews. Multiplying the screener and extended rates gives an overall response rate for each type of interview. At the household level, the percentage of households completing one or more of the extended interviews (adult, child, and/or adolescent) is a useful summary of the overall success of the study. For CHIS 2005, the household response rate was 29.5 percent (the product of the screener response rate and the completion rate at the household level of 59.3 percent). The 2005 survey is the first time that a household response rate has been reported because in earlier cycles the adult interview had to be completed before the child or the adolescent interview (i.e., the household rate equaled the adult rate). The adult extended completion rate for 2005 was 54.0 percent, resulting in an overall adult response rate of 26.9 percent for adults. All of the household and person level response rates vary by sampling stratum. For more information about the CHIS 2005 response rates, please see *CHIS 2005 Methodology Series: Report 4 – Response Rates*.

The CHIS response rate is comparable to response rates of other scientific telephone surveys in California, such as the 2005 California Behavioral Risk Factor Surveillance System (BRFSS) Survey with an overall response rate of 29.2 percent. California as a whole and the state's urban areas in particular, are among the most difficult parts of the nation in which to conduct telephone interviews. Survey response rates tend to be lower in California than nationally, and over the past decade response rates have been declining both nationally and in California.

One way to judge the representativeness of a population survey is to "benchmark" its results against those of other reliable data sources. The CHIS 2001 and 2003 samples yielded unweighted and weighted population distributions and rates that are comparable to those obtained from other sources. The demographic characteristics of the CHIS 2001 sample (such as race, ethnicity, and income) were very similar to those obtained from 2000 Census data. CHIS 2001 respondents also had health characteristics and behaviors that were very similar to those found in other extensively used surveys, such as the California BRFSS. The UCLA Center for Health Policy Research is conducting an extensive benchmarking project for CHIS data.

Adults who completed at least approximately 80 percent of the questionnaire (i.e., through Section J on Health Care Utilization and Access), after all follow-up attempts were exhausted to complete the full questionnaire, were counted as "complete." At least some items in the employment and income series or public program eligibility and food insecurity series are missing from those cases that did not complete the entire interview.

Proxy interviews were allowed for frail and ill persons over the age of 65 who were unable to complete the extended adult interview in order to avoid biases for health estimates of elderly persons that might otherwise result. Eligible selected persons were recontacted and offered a proxy option. For 139 elderly adults, a proxy interview was completed by either a spouse/partner or adult child. A reduced questionnaire, with questions identified as appropriate for a proxy respondent, was administered. (Note: questions not administered in proxy interviews are given a value of "-2" in the data files.)

1.5 Weighting the Sample

To produce population estimates from the CHIS data, weights are applied to the sample data to compensate for the probability of selection and a variety of other factors, some directly resulting from the design and administration of the survey. The sample is weighted to represent the non-institutionalized

population for each sampling stratum and statewide. The weighting procedure used for CHIS 2005 accomplishes the following objectives:

- Compensate for differential probabilities of selection for households and persons;
- Reduce biases occurring because nonrespondents may have different characteristics than respondents;
- Adjust, to the extent possible, for undercoverage in the sampling frames and in the conduct of the survey; and
- Reduce the variance of the estimates by using auxiliary information.

As part of the weighting process, a household weight was created for all households that completed the screener interview. This household weight is the product of the "base weight" (the inverse of the probability of selection of the telephone number) and a variety of adjustment factors. The household weight is used to compute a person-level weight, which includes adjustments for the within-household sampling of persons and nonresponse. The final step is to adjust the person-level weight using a raking method so that the CHIS estimates are consistent with population control totals. Raking is an iterative procedure that forces the CHIS weights to sum to known totals from an independent data source. The procedure requires iteration to make sure all the control totals, or raking dimensions, are simultaneously satisfied within a specified tolerance.

Population control totals of the number of persons by age, race, and sex at the stratum level for CHIS 2005 were created primarily from the California Department of Finance's 2004 Population Estimates and 2005 Provisional Population Estimates. The raking procedure used 11 raking dimensions, which are combinations of demographic variables (age, sex, race, and ethnicity), geographic variables (county, Service Planning Area in Los Angeles County, and Health Region in San Diego County), household composition (presence of children and adolescents in the household), and socio-economic variables (home ownership and education). The socio-economic variables are included to reduce biases associated with excluding households without landline telephones from the sample frame. One limitation of using Department of Finance data is that it includes about 2.4 percent of the population of California who live in "group quarters" (i.e., persons living with nine or more unrelated persons). These persons were excluded from the CHIS sample and as a result, the number of persons living in group quarters was estimated and removed from the Department of Finance control totals prior to raking.

1.6 Imputation Methods

Missing values in the CHIS data files were replaced through imputation for nearly every variable. This was a massive task designed to enhance the analytic utility of the files. Westat imputed missing values for a handful of variables used in the weighting process and UCLA staff imputed values for nearly all other variables.

Two different imputation procedures were used by Westat to fill in missing responses for items essential for weighting the data. The first imputation technique was a completely random selection from the observed distribution of respondents. This method was used only for a few variables when the percentage of the items missing was very small. The second technique was hot deck imputation without replacement. The hot deck approach is probably the most commonly used method for assigning values for missing responses. With a hot deck, a value reported by a respondent for a particular item is assigned or donated to a "similar" person who did not respond to that item. The characteristics defining "similar" vary for different variables. To carry out hot deck imputation, the respondents to an item form a pool of donors, while the nonrespondents are a group of recipients. A recipient is matched to the subset pool of donors based on household and individual characteristics. A value for the recipient is then randomly imputed from one of the donors in the pool. Once a donor is used, it is removed from the pool of donors for that variable. Hot deck imputation was used to impute the same items in CHIS 2003 and CHIS 2005 (i.e., race, ethnicity, home ownership, and education).

The UCLA Center for Health Policy Research imputed missing values for nearly every variable in the data files other than those handled by Westat and some sensitive variables in which nonresponse had its own meaning. Overall, item nonresponse rates in CHIS 2005 were modest, with most variables missing valid responses for less than 2 percent of the sample. However, there were a few exceptions where item nonresponse rate was greater than 20 percent, such as household income.

The imputation process conducted by UCLA started with data editing, sometimes referred to as logical or relational imputation: for any missing value, a valid replacement value was sought based on known values of other variables of the same respondent or other sample(s) from the same household. For the remaining missing values, hierarchical sequential hot-deck imputation with donor replacement was used. This method replaces a missing value for one respondent using a valid response from another respondent with similar characteristics as defined by a set of control variables. The control variables were ranked in order from the most to the least important. This procedure allowed control variables to be dropped if certain conditions (such as the minimum number of donors) were not met. The control

variables were dropped sequentially, starting from the variable ranked least important. Once a responding case was used as a donor, it was dropped from the donor pool preventing using one donor multiple times.

Control variables always included the following: gender, age group, race/ethnicity, poverty level (based on household income), educational attainment, and region. Other control variables were also used depending on the nature of the imputed variables. Among the control variables, gender, age, race/ethnicity and regions were imputed by Westat. Household income and educational attainment were imputed first in order to impute other variables. Household income, for example, was imputed using the hot-deck method within ranges from a set of auxiliary variables such as income range and/or poverty level.

The imputation order of the other variables followed the questionnaire. After all imputation was done, logical checks and edits were performed once again to ensure consistency between the imputed and nonimputed values on a case-by-case basis.

1.7 Methodology Report Series

A series of five methodology reports is available with more detail about the methods used in CHIS 2005:

- Report 1 – Sample Design;
- Report 2 – Data Collection Methods;
- Report 3 – Data Processing Procedures;
- Report 4 – Response Rates; and
- Report 5 – Weighting and Variance Estimation.

For further information on CHIS data and the methods used in the survey, visit the California Health Interview Survey Web site at www.CHIS.ucla.edu or contact CHIS at CHIS@ucla.edu.

2. USE OF RESPONSE RATES

In recent years there has been a shift away from the use of response rates as a single measure of the quality of a survey or of nonresponse bias. Research by Keeter et al. (2000), Curtin, Presser, and Singer (2000), and Merkel and Edelman (2002) has questioned the practice of relying solely on response rates. Although response rates do provide valuable information on the success of the survey at representing the population sampled, as suggested by Madow et al. (1983), they are not sufficient for fully assessing data quality. This is because the bias in an estimate is related to both the response rate and the characteristics of those responding and not responding. This relationship is discussed below.

The main objective of this report is to present response rates to analysts of CHIS 2005 data and explain the methods used to calculate them. It also provides information about how well various subgroups of the California population are represented. To accomplish this goal, the response rates are weighted so that they are estimated proportions of the population responding to the survey. This procedure is consistent with the standards given by the American Association for Public Opinion Research (AAPOR, 2006). For example, weighted response rates account for differing sampling rates by county (*CHIS 2005 Methodology Series: Report 1 – Sample Design)* and, thus, are appropriate when the state-level response rate is reported.

The rationale for using weights in computing the response rate is that the bias of a simple statistic, such as a mean based on respondent data ($\bar{y}_r$), is a function of the response rate and the difference in the means between the respondents and nonrespondents. A simple way of conceptualizing this is by assuming the population is partitioned into a stratum of respondents (*R*) and a stratum of nonrespondents (*NR*). The survey estimates are computed with the observations from the respondent stratum, where each observation is weighted by the inverse of its selection probability. In a probability sample survey, the bias attributable to nonresponse of $\bar{y}_r$ is

$$bias(\bar{y}_r) = (1-r)(\bar{Y}_R - \bar{Y}_{NR}), \tag{1}$$

where *r* is the appropriately weighted response rate and the quantity on the right is the difference in the means between the respondent and nonrespondent strata (Lessler and Kalsbeek, 1992). This formula shows that the bias increases as the response rate decreases, provided the difference between respondents and nonrespondents remains constant. If the response rates are not weighted, this relationship does not hold. Returning to the example, if the county samples are not weighted by their selection probabilities, then the response rate cannot be used in the bias equation (1).

While expression (1) suffices for many purposes, another approach aids in understanding the effect of response rates stochastically. This approach assumes each unit i in a population of size N has a response propensity or a likelihood of responding to the survey, denoted as ϕ_i. Nonresponse is treated much like a second phase of sampling, but the response propensities are unknown. The bias of the estimator of a mean is

$$N^{-1}\bar{\phi}^{-1}\sum(\phi_i - \bar{\phi})(y_i - \bar{y}), \tag{2}$$

where ϕ and y are the response probability and the value of the characteristic being estimated, respectively. Under this model, estimates from respondents are unbiased if there is no correlation between the response propensity and the characteristic being estimated. Both expressions (1) and (2) indicate bias is more likely when persons with certain characteristics have different rates of responding to the survey. We examine such relationships in later chapters.

The sample for CHIS 2005 includes both an RDD sample and a Korean and Vietnamese oversample using geographic targeting and surname lists as described in *CHIS 2005 Methodology Series: Report 1 – Sample Design*. The response rates are computed for the combined RDD and surname list samples The Vietnamese and Korean surname list samples were jointly weighted with the RDD sample, and the sampling weights reflect the multiple probabilities of selection from the different sampling frames. The weighting procedure is described in detail in *CHIS 2005 Methodology Series: Report 5 – Weighting and Variance Estimation*. Note that this procedure is different from CHIS 2001 where the supplemental race and ethnic samples were not jointly weighted with the RDD sample so only unweighted response rates were computed for the supplemental samples.

3. DEFINING RESPONSE RATES

The term "response rate" is used in many different ways across surveys and organizations so its careful definition is important. Two organizations that describe response rates in a relatively consistent manner are the Council of American Survey Research Organizations (CASRO, 1982) and the American Association for Public Opinion Research (AAPOR, 2006). The AAPOR report is periodically updated and is available on the organization's website (http://www.aapor.org).

We use the definitions described in the AAPOR report, which includes several different response rate definitions. Among them are the RR4 and RR3 definitions that are most commonly accepted in the current survey research field. The only difference is that RR3 does not include partial completes while RR4 does. This report uses AAPOR's RR4. Since telephone numbers were sampled with different selection probabilities in CHIS 2005, we use the weighted number of telephone numbers rather than the unweighted number in the response rate computation as discussed in Chapter 2. This approach also compensates for the under- and oversampling implemented in different geographic areas.

Both AAPOR and CASRO recommend that a survey response rate be defined as the ratio of completed interviews to eligible reporting units (i.e., residential households). This recommendation is more difficult to apply than it may appear, especially in RDD surveys, as determining the eligibility of some sampled numbers is problematic; because some telephone numbers, even after being called multiple times over a range of days and times of day, are never answered or are picked up only by answering machines. This outcome may occur for many reasons, as discussed by Shapiro et al. (1995). The eligibility of these numbers cannot be determined directly, adding ambiguity to the definition of a response rate.

This proportion of telephone numbers that are eligible (or residential) is denoted as '*e*' in the AAPOR RR4 equation. Once the eligibility proportion is established, the response rate can be computed as the weighted ratio of the responding telephone numbers to the total of known and estimated eligible numbers. One of the first approaches used for estimating *e* was suggested in CASRO (1982). CASRO estimates *e* as the proportion of the resolved telephone numbers that are residential.

Because the CASRO method overestimates *e*, CHIS 2001 and 2003 computed *e*, based on the "survival method" described in Brick, Montaquila, and Scheuren (2002). In this method, a subsample of the telephone numbers with unknown eligibility is dialed additional times to resolve eligibility. In CHIS 2005, however, the survival method was not used because the percentage of unknown eligibility

cases appears to have increased substantially. This change calls into question a key assumption of the survival method — that these cases can be resolved with an infinite number of calls.

The method used in CHIS 2005 to estimate *e* is similar to the method described in Shapiro et al. (1995), In Shapiro et al. (1995) calls were made to local telephone companies to determine with certainty the connectivity of unresolved telephone numbers. In CHIS 2005, a similar method was used that computes the proportion of estimated households among the undetermined cases using newly available vendor services. A random sample of undetermined numbers was sent to a vendor to determine the connectivity status of the numbers. The vendor queries the telephone numbers through a nationwide network verified by the telephone central office (TELCO) with data created by various telecommunications partnerships. The query result indicates the connectivity status of a telephone number including information such as use and type of service. The results are thus used to compute *e* within several categories defined by urban status, mailable status of the telephone number, and the content of answering machine messages as determined by an interviewer (e.g., possible residential, possible nonresidential, or unknown). These categories are the same as those used in the survival method in CHIS 2003.

Beginning in CHIS 2003, households that refused to participate in the initial screening interview were subsampled and only those in the subsample were called again in a refusal conversion process. Subsampling of refusals for refusal conversion is a technique used to reduce costs and improve efficiency. Since only the subsampled cases are retained for the analysis (along with those that did not refuse), they are weighted by the inverse of the subsampling rate. This procedure was also used in CHIS 2005 and is described in detail later.

The next step in computing response rates depends on the particular extended interviews being analyzed, such as the adult interview. For example, to compute the response rate for the adult interview, the numerator is the weighted number of completed adult interviews and the denominator is the weighted number of eligible adults sampled in households that completed the screening interview. An overall or joint response rate can be computed by multiplying the screening and adult interview rates.

In previous cycles, the adult interview had to be completed before children or adolescents could be interviewed. In 2005, the child-first procedures[1] permitted child or adolescent interviews to be done before the adult interview in some circumstances. As a result, we have computed a household-level

[1] A complete description of the child-first procedures is found in *CHIS 2005 Methodology Series: Report 2 – Data Collection.*

response rate that considers a household to be a respondent if either an adult or a child interview is completed. The specifics of the computations are discussed later.

Computing a response rate for a subgroup (e.g., female) requires that all the units in both the numerator and denominator of the rate can be classified as members of the subgroup. To do this, data must be available to classify all sampled units, not just respondents. At the screener level, data to identify subgroups from the sampled telephone numbers are limited. However, the telephone numbers can be classified by geography (county or stratum) and by whether an address could be matched to the telephone number for mailing advance letters. At the extended interview or person level, data from the screener can be used to classify households by characteristics that are known for all completed households. Because the screening interview identifies the gender of selected persons, extended interview response rates can be computed separately for males and females. However, screener response rates cannot be computed by gender because data on gender are not available for every sampled telephone number. Therefore, the subgroup overall response rate must be computed by multiplying the extended interview response rate for the subgroup by the overall screener response rate. These data are used to compute the subgroup response rates in CHIS 2005 later.

4. REVIEW OF CONTACT METHODS

CHIS 2005 Methodology Series: Report 2 – Data Collection Methods provides a detailed discussion of the methods used in CHIS 2005 to contact and interview persons. Here we briefly review the key procedures to provide some background on the response rates and evaluation measures presented later in this report.

As mentioned before, the survey contained both screening and extended interviews. In each household, one adult was sampled for an extended interview. In households with persons under age 17, one child and one adolescent were also sampled. The screening interview took, on average, about 2 to 3 minutes to conduct. A parent or guardian was interviewed about the sampled child and the sampled adolescent was interviewed if a parent or guardian gave permission. The adult extended interview averaged about 35 minutes in length, the child interview about 15 minutes, and the adolescent interview about 20 minutes. The interviews in languages other than English generally took longer than these averages. Detailed interview timing information is given in *CHIS 2005 Methodology Series: Report 2 – Data Collection Methods*.

Before calling sampled telephone numbers, Westat mailed an advance or prenotification letter to those for which an address could be obtained from reverse directory services. The letter informed the household that they would be called to participate in CHIS 2005, that their participation was voluntary but important to the success of the survey, and that the survey was legitimate. The letter contained a $2 cash incentive to encourage the sampled households to respond. An experiment was conducted to examine the effect of the sponsorship of the study as identified in the letter. To test whether sampled persons were more willing to respond to different sponsors, the experiment varied three sponsors: UCLA, the National Cancer Institute, and the county where the sample resides. The experiment was actually more complicated because it also varied sponsorship in refusal conversion letters that were mailed to those that initial did not participate. Details on this experiment are given in *CHIS 2005 Methodology Series: Report 2 – Data Collection Methods*.

After the advance mailing, initial telephone calls were made to complete the screener interview with a household respondent who was at least 18 years old. Multiple attempts, at least 14 attempts if needed, were made to establish the initial contact with the household. If the household refused to participate, and the number was part of the refusal subsample, additional attempts were made to

complete the screener after waiting 1-3 weeks following the first refusal.[2] Prior to attempting to convert these refusals into participants, a letter was sent to the household (if an address was available) informing them again about the validity of the study and the importance of their participation. As noted above, this letter was included in the sponsorship experiment. If the household refused again, a second refusal conversion telephone attempt was made at least another 2 weeks later.

A similar process was used at the extended level for the sampled adult. The sampled adult was asked to participate in the study up to three times—an initial attempt and two attempts at refusal conversion. If the adult refused, a letter was sent (if an address was available) urging him or her to participate. A second refusal conversion attempt for both the screener and the adult extended interview was done only for those cases where the review of interviewer reports on the previous refusals indicated that an additional attempt was warranted. For child and adolescent interviews, one refusal conversion attempt was made. No letters were sent for either the child or adolescent interview. However, if the parent refused permission for the adolescent to be interviewed, then a letter was mailed to the parent asking him or her to reconsider. Attempts at refusal conversion were stopped at any point if the respondent expressed hostility at being called or specifically requested that they not be called again.

A variety of other methods were used to increase response rates in CHIS 2005. A very important procedure involved translating and conducting the interview in Spanish, Chinese (Cantonese and Mandarin), Korean, and Vietnamese to accommodate households that did not speak English. Another method to increase response rates was the use of proxy interviews for adults who were over age 65 and unable to participate because of mental or physical limitations. Other adult household members knowledgeable about the sampled persons' health, almost always a spouse or child of the sampled adult, completed a proxy interview in these cases; 142 adult proxy extended interviews were completed.

In addition to the efforts to encourage respondents to participate, other approaches were used to increase response rates. Interviewers were trained and given refresher training on methods to avoid refusals and to convert those who had refused. Only those interviewers who had above average response rates were trained and allowed to conduct refusal conversions. Multiple call attempts were made to contact sampled household members to complete the extended interviews. On average, 14 call attempts were made to contact an adult before a case was classified as a nonrespondent.

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[2] A 60 percent subsample of all sample phone numbers was randomly assigned a refusal conversion flag. Additional calls were attempted only for initial refusals that were part of this 60 percent subsample. See Chapters 7 and 8 for additional details. This subsampling applied only to the screener interview first refusal conversion. All cases were available for refusal conversion at the extended interview level.

Later in this report, we discuss some of these methods and describe the increases in the number of interviews that resulted, where possible. Some methods, such as interviewer training, cannot be assessed quantitatively without specially designed experiments.

5. RESPONSE RATE FORMULAS

This chapter describes the formulas used to compute the response rates for CHIS 2005. Response rates are calculated for the screener and extended interviews, including household and person overall response rates. It is important to note that in CHIS 2005, refusal conversion procedures were applied to a random subsample of screener interview refusals. As a result, unweighted response rates are not comparable to weighted rates and should not be used to assess response patterns because they do not reflect the subsampling of refusal conversion cases.

A screener response rate is calculated for each sampled stratum (county or group of counties). In the report we will often refer to these as counties, but we are referring to both the counties and the groups of counties used in sampling as reported in Table 1-1. Response rates for a county or the entire state can be computed in the same way. The formula for the screener response rate (rr_S) in a sample county is

$$rr_S = \frac{\sum_{i \in S_{resp}} w_i}{\sum_{i \in S_{resid}} w_i}, \tag{3}$$

where w_i is the weight for telephone number i in the county after adjusting for differential sampling rates, refusal conversion subsampling, and the assignment of telephone numbers with unknown residential status; S_{resp} is the set of telephone numbers in the county that responded to the screening interview; and S_{resid} is the set of telephone numbers in the county that were residential. As noted earlier, the estimated residential rates were determined through an empirical method using a telephone vendor service.

The screener response rate for the state is computed in exactly the same way, except the sum is over the whole state rather than in the specific county. Thus, the state screener response rate is a weighted average of the county screener response rates where weights are equal to the population in the counties. As a result, the state response rate differs from what would be obtained from the unweighted average of the response rates of the counties.

As mentioned in the previous chapter, because the child-first procedure was implemented in 2005 some sampled households completed child or adolescent interviews without completing an adult interview. In these cases, some household-level information normally collected as part of the adult interview was collected in the child interview. As a result, a household-level response rate at the extended

interview level is appropriate to measure the percent of households cooperating in CHIS. The household is counted as a respondent if either an adult or child extended interview was completed in the household. Those households with only an adolescent extended interview (there were only 62 such households) are not included: household-level data were not collected in these cases. The household extended interview response rate rr_h is computed as

$$rr_h = \frac{\sum_{i \in H_{resp}} w_i^*}{\sum_{i \in H_{scr}} w_i^*}. \tag{4}$$

where w_i^* is the poststratified weight for household *i* in the county[3]; H_{resp} is the set of households in the county where at least one adult or child extended interview was completed, and H_{scr} is the set of households where the screener interview was completed. The household response rate is conditioned on the completion of the screener interview.

The next set of response rates is at the extended interview level. The extended response rate for the adult interview in a county is the weighted percentage of the adults sampled in the screener who completed the adult extended interview. The weight in this case is the inverse of the probability of selecting the adult within the household. Because of this weighting, adults sampled from households with more than one adult have a larger effect on the response rate than those in households with only one adult. The extended adult response rate (rr_a) is

$$rr_a = \frac{\sum_{i \in A_{resp}} w_i'}{\sum_{i \in A_{eligsamp}} w_i'}, \tag{5}$$

where the numerator is summed over all adult respondents, and the denominator is summed over all eligible sampled adults. The weight being summed in this case, w', is the adult weight that accounts for selecting the adult within the household. The adult response rate is conditioned on the completion of the screener interview.

The extended response rate computation for children and adolescents is similar to the adult procedure; however, the method of sampling adds some complexity. Beginning in CHIS 2005, the child-

[3] A complete description of the poststratified household weight is found in Section 3-9 of the *CHIS 2005 Methodology Series: Report 5 – Weighting and Variance Estimation*.

first procedures were used to increase the number of completed child interviews under certain conditions. Persons under 18 years of age could be enumerated either at the end of the screener (the child-first procedure) or during the adult extended interview. If the adult interview had to be done before the child interview because the conditions for the child-first procedures were not met, then the child and adolescent extended response rates include only those households in which the adult extended interview is completed. In this case, the child or adolescent rate is conditional on the adult interview. If the child first procedures were implemented, then the child response rate is conditioned only on the screener. The extended child response rate (rr_C) is

$$rr_c = \frac{\sum_{i \in C_{resp}} w_i''}{\sum_{i \in C_{eligsamp}} w_i''}, \tag{6}$$

where the numerator is summed over all child respondents, and the denominator is summed over all eligible sampled children. The weight being summed in this case, w'', is the inverse of the probability of selecting the child within the household. To discriminate between the different sampling situations we add a subscript K to identify the procedure; $rr_{c,K}$ is the child extended interview response rate for children who were interviewed using the child-first procedure, and $rr_{c,\bar{K}}$ is the child extended interview response rate for children who were interviewed without using the child-first procedure.

Exactly the same procedure is used for the adolescent extended interview response rate (rr_t) and it is

$$rr_t = \frac{\sum_{i \in T_{resp}} w_i'''}{\sum_{i \in T_{eligsamp}} w_i'''}, \tag{7}$$

where the numerator is summed over all adolescent respondents, and the denominator is summed over all eligible sampled adolescents. The weight being summed in this case, w''', is the inverse of the probability of selecting the adolescent within the household. Again, $rr_{t,K}$ is used to identify the rate for adolescents who were interviewed using the first child first procedure, and $rr_{t,\bar{K}}$ is for adolescents who were interviewed without using the child-first procedure.

An important source of nonresponse for the adolescent interview was the parent refusing to provide permission to conduct the interview with the adolescent. The response rate given by (7) includes

the parent permission as a source of nonresponse. Another response rate of interest is the adolescent response rate conditioned on the parent giving permission to interview the adolescent. This fully conditional adolescent response rate is

$$rr_{t-p} = \frac{\sum_{i \in T_{resp}} w_i'''}{\sum_{i \in T_{eligsamp-per}} w_i'''}, \tag{8}$$

where the only difference is that the denominator is summed over only those adolescents for whom the parents gave permission for the adolescent interview.

The response rates defined above, except for the screener response rate, are conditional rates in the sense that they depend on the household participating in the screener stage of CHIS. We calculate overall response rates to eliminate the conditioning. For example, the household response rate is conditioned only on the completion of the screener. The overall household response rate is the product of the screener and household response rates and is

$$orr_h = rr_s \cdot rr_h \tag{9}$$

Since the adult response rate is conditioned on the completion of the screener, like the household response rate, the product of the screener and adult response rate is an unconditional or overall adult response rate. Thus, the overall adult response is

$$orr_a = rr_s \cdot rr_a \tag{10}$$

The child response rate is conditioned on the screener being completed and either the child interview being completed for households with children using the child-first procedure or the adult interviews being completed for those not using the procedure. The overall response rate for the child, orr_c is defined as

$$orr_c = rr_s \cdot \left(p_K \cdot rr_{c,K} + p_{\overline{K}} \cdot rr_{ac,\overline{K}} \cdot rr_{c,\overline{K}} \right) \tag{11}$$

where $rr_{ac,\overline{K}}$ is the extended adult interview response rate for adults in households with children who were sampled without using the child-first procedures, and p_{Kc} and $p_{\overline{K}c}$ are the proportions of households with children in which the child-first procedures were used or not, respectively (i.e.,

$p_{Kc} + p_{\overline{K}c} = 1$). Notice that if the child-first procedures had not been used, the overall child response rate becomes $orr_c = rr_s \cdot rr_{ac} \cdot rr_c$ as in previous cycles of CHIS.

For adolescents, the overall response rate accounting for all levels of response (completion of the screener, the completion of the adult interview in households with adolescents, and the use of child first procedure) is

$$orr_t = rr_s \cdot \left(p_{Kt} \cdot rr_{t,K} + p_{\overline{K}t} \cdot rr_{at,\overline{K}} \cdot rr_{t,\overline{K}} \right), \tag{12}$$

where $rr_{at,\overline{K}}$ is the extended adult interview response rate for adults in households with adolescents where the child-first procedures were not used, and p_{Kt} and $p_{\overline{K}t}$ are the proportion of households with adolescents in which the child-first procedures were used or not respectively (i.e., $p_{Kt} + p_{\overline{K}t} = 1$). The overall response rate for the adolescent excluding the permission request (which would involve using rr_{t-p}) is not presented because it is not of much interest as an overall rate.

The calculation of the child and adolescent response rates assumes that the screener response rate is the same in households where children and/or adolescents are present as in those without children or adolescents. This is a necessary assumption, since the household composition for screener interview nonrespondents cannot be verified.

6. RESPONSE RATE TABLES

This chapter contains tables of response rates from the combined RDD and surname list samples for CHIS 2005, statewide and for each of the household sampling strata. The first tables are the response rates for the specific interviews: the screener, the adult, the child, and the adolescent interviews, along with the household rate (which is a combination of interviews). The overall response rates for each extended interview type are then presented. All of the rates in the tables in this chapter are weighted and use the formulas presented in the previous chapter.

6.1 Screener Response Rates

The screener response rates for each sampling stratum are given in Table 6-1. The first column in the table gives the number of households that completed the screening interview. Overall, 73,814 households across the state cooperated with this first step of the CHIS 2005 interview. In each of these households, one adult was sampled.

The overall screener response rate for the state, including the sample drawn from the surname lists, is 49.8 percent. As discussed in Chapter 3, this response rate is computed by using data from a vendor service to allocate the numbers whose eligibility cannot be determined (those for which every call was not answered or only answered by an answering machine). Alternative definitions for allocating these undetermined numbers used in some other surveys may give slightly different response rates. One approach used by some is to ignore the undetermined numbers in the computation of response rates. This approach gives a *cooperation rate*. Dropping all the undetermined numbers for CHIS 2005 gives an overall state-level cooperation rate of 57.0 percent. Another approach is to use what is called the CASRO rate. The CASRO screener response rate for the entire state is 47.9 percent, which is about 2 percentage points lower than the vendor method. For the remainder of the report, we use the vendor method for all response rates.

Table 6-1. Number of completed screeners and response rates by sampling stratum and whether an advance letter was sent

	Total		Letter		No letter	
	Complete	Response rate	Complete	Response rate	Complete	Response rate
State total	73,814	49.8	61,978	52.3	11,836	40.1
Los Angeles	16,157	46.6	13,662	49.0	2,495	37.2
San Diego	7,006	48.1	5,742	50.6	1,264	39.2
Orange	4,536	46.8	3,700	49.5	836	38.0
Santa Clara	2,497	45.7	2,145	48.9	352	32.3
San Bernardino	2,368	53.7	1,860	55.4	508	48.3
Riverside	2,384	52.7	1,855	54.1	529	48.1
Alameda	2,128	49.4	1,835	52.6	293	35.3
Sacramento	1,873	53.0	1,543	55.8	330	42.9
Contra Costa	1,324	51.5	1,170	54.5	154	35.9
Fresno	1,033	57.2	857	59.5	176	48.3
San Francisco	1,292	43.1	1,119	46.5	173	28.9
Ventura	1,132	52.4	938	54.8	194	43.5
San Mateo	1,097	45.6	959	48.1	138	34.2
Kern	1,074	55.3	897	57.0	177	47.6
San Joaquin	818	55.7	679	56.5	139	52.1
Sonoma	734	52.4	657	55.1	77	37.1
Stanislaus	778	56.5	672	58.7	106	45.8
Santa Barbara	827	52.1	684	55.9	143	39.1
Solano	2,079	51.8	1,825	53.6	254	41.8
Tulare	815	57.5	688	59.5	127	49.3
Santa Cruz	822	55.4	695	58.5	127	43.0
Marin	4,888	49.0	4,278	52.8	610	32.2
San Luis Obispo	756	56.3	645	57.9	111	48.2
Placer	795	52.5	623	55.8	172	43.2
Merced	828	55.1	693	55.9	135	51.5
Butte	712	60.3	601	62.1	111	52.1
Shasta	745	61.8	610	63.7	135	54.9
Yolo	767	56.2	645	58.4	122	46.8
El Dorado	737	54.3	616	55.9	121	48.1
Imperial	756	51.3	660	53.9	96	37.4
Napa	770	47.3	691	50.8	79	29.9
Kings	832	58.7	709	61.6	123	46.3
Madera	801	57.4	595	59.2	206	53.0
Monterey	941	47.5	784	50.5	157	36.5
Humboldt	1,178	60.9	1,017	63.5	161	48.4
Nevada	597	53.6	459	55.8	138	47.8
Mendocino	608	51.6	540	54.5	68	36.0
Sutter	657	55.4	546	57.9	111	45.1

Table 6-1. Number of completed screeners and response rates by sampling stratum and whether an advance letter was sent (continued)

	Total		Letter		No letter	
	Complete	Response rate	Complete	Response rate	Complete	Response rate
Yuba	606	57.3	499	58.9	107	50.8
Lake	619	54.8	549	56.6	70	43.6
San Benito	663	54.8	559	57.1	104	45.4
Colusa, Glenn, Tehama	623	57.2	525	59.7	98	46.5
Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, Trinity	543	60.5	458	65.6	85	42.8
Amador, Alpine, Calaveras, Inyo, Mariposa, Mono, Tuolumne	618	53.0	494	57.3	124	40.2

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

The table shows that the screener response rates vary by county, which is also illustrated in Figure 6-1. The median response across all counties is 53.7 percent, and the highest response rate is 61.8 percent in Shasta County. San Francisco has the lowest response rate at 43.1 percent, which is clearly at the low end of the scale in Figure 6-1. The next lowest response rate (San Mateo) is about 2.5 percentage points higher than the San Francisco rate. The screener response rate in Los Angeles is 3.5 percentage points higher than the San Francisco rate yet 3.2 points lower than the state response rate. The county rankings shown in Figure 6-1 are relatively consistent from 2001 to 2005, as discussed later.

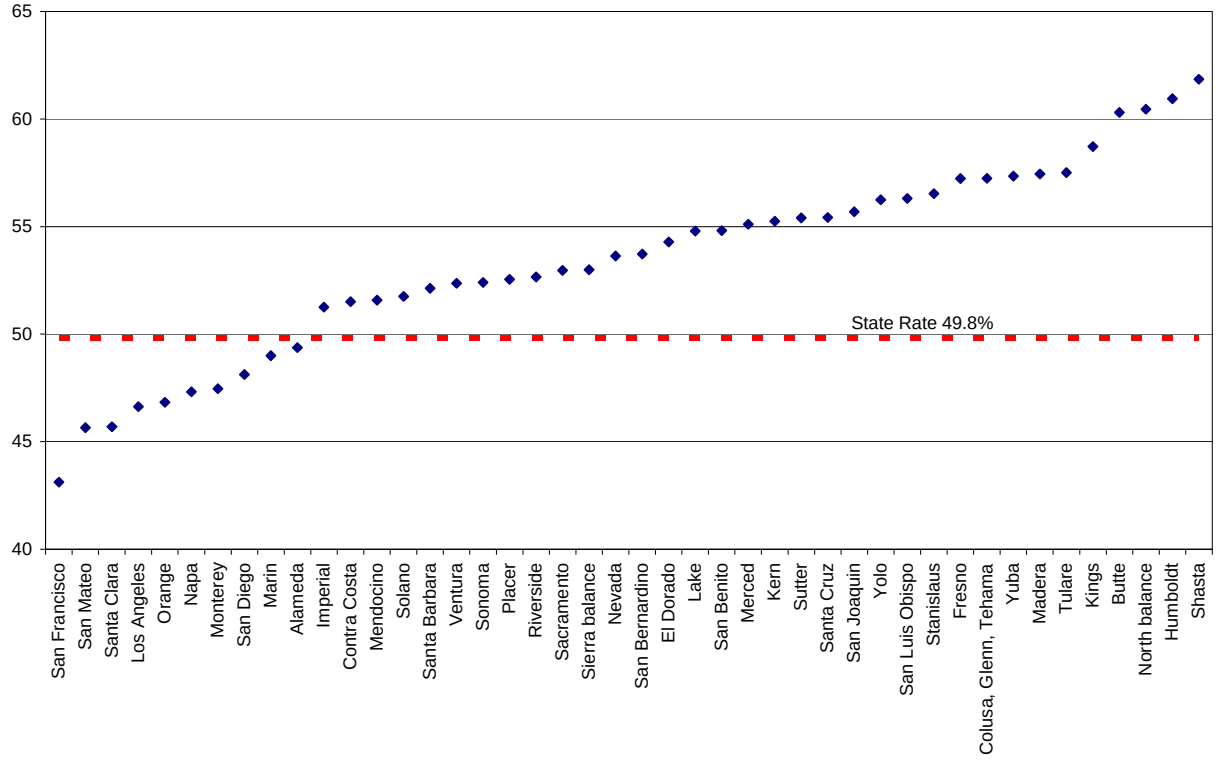

Figure 6-1. Screener response rate distribution by sampling stratum

The median response rate for counties with a population of more than 500,000 persons (the counties from Los Angeles through San Joaquin in Table 6-1) is 51.5 percent. This is 3.6 percentage points lower than the 55.1 percent median response rate for the smaller counties. Looking at the individual counties suggests that this difference may be a function of proximity to a metropolitan area or population density rather than the population size of the county. Small, highly urban counties have rates similar to those of the more populous counties. This differential is not as large as was observed in the CHIS 2003 stratum-level response rates.

Table 6-1 also tabulates the response rates by whether an advance letter could be mailed to the household. We discuss these rates later. Next, we examine the person and household level response rates.

6.2 Person and Household Response Rates

The household, adult, child, and adolescent extended interview response rates for each stratum in CHIS 2005 are given in Table 6-2, along with the number of completed interviews. There were 45,649 households where at least one adult or child extended interview was completed, resulting in a statewide household level response rate of 59.3 percent. In all of these households some of the most critical data elements were obtained. Additionally, a total of 43,020 adult interviews, 11,358 interviews about children, and 4,029 adolescent interviews were completed.

The statewide response rate shown in Table 6-2 for the adult interview was 54.0 percent, a decrease of six percentage points from CHIS 2003. As with the screener response rate, counties with larger populations tended to have lower adult extended interview response rates. The median adult response rate for the counties with a population of more than 500,000 is 53.5 percent, while for counties with less than 500,000 the median adult response rate is 59.0 percent. This difference may be attributable to a variety of reasons, including the different distribution of persons by age, education, etc., by county.

Data collected in the screener interview about the household and the sampled adult can be used to examine the adult extended response rates since the data are available for all sampled adults. Table 6-3 shows the adult response rates by these screener data items.[4] There is substantial variation in the response rates by these characteristics as women responded at a higher rate than men and older adults were more likely to respond than younger adults. Adults in households without children had a higher response rate. All of these relationships are similar to those observed in 2003. One new item that was not presented in previous cycles is the adult response rate by whether or not the screener respondent was the sampled adult. The rates differ greatly by this condition, with those who are the screener respondents being much more likely to complete the adult interview. This outcome echoes the differential observed in every RDD survey we have examined. For example, in 2005 the National Household Education Survey (Hagedorn, et. al., 2006) found that the extended interview rate for adults who were the screener respondents was almost 30 percentage points higher than for adults who were not the screener respondents.

[4] In some cases the data from the screener interview and the adult interview may differ. For example, the age of the adult reported by the household member in the screener may be different from the age reported by the sampled adult. All of the data used in these tabulations are the screener data because no other data are available for the nonresponding adults.

Table 6-2. Number of completed extended interviews and response rates by sampling stratum and type of interview

	Household		Adult		Child		Adolescent	
	Complete	Response rate	Complete	Response rate	Complete	Response rate	Complete	Response rate
State total	45,649	59.3	43,020	54.0	11,358	75.2	4,029	48.5
Los Angeles	9,268	55.7	8,712	50.5	2,145	72.1	793	43.8
San Diego	4,245	58.7	3,828	53.5	1,797	74.8	411	46.8
Orange	2,652	56.4	2,493	50.8	659	73.1	222	47.9
Santa Clara	1,542	60.6	1,443	55.9	426	77.6	125	53.6
San Bernardino	1,425	58.4	1,325	53.2	402	76.9	150	50.0
Riverside	1,418	57.9	1,322	52.0	367	73.2	137	49.4
Alameda	1,378	63.7	1,318	59.2	314	75.6	106	45.3
Sacramento	1,221	63.2	1,166	58.0	279	78.3	108	55.9
Contra Costa	886	65.4	843	59.6	202	80.7	76	53.6
Fresno	634	60.1	598	55.0	168	79.9	72	51.8
San Francisco	796	60.9	777	55.9	104	73.2	33	46.2
Ventura	663	54.7	632	49.5	175	78.6	64	46.9
San Mateo	705	64.6	661	58.3	164	76.3	57	52.6
Kern	646	57.3	606	51.9	182	79.7	67	57.9
San Joaquin	500	59.3	469	52.7	141	78.5	48	48.9
Sonoma	502	66.2	488	62.7	83	78.1	34	48.9
Stanislaus	494	62.5	467	56.3	128	67.1	47	54.0
Santa Barbara	497	57.7	472	53.5	126	76.7	47	59.6
Solano	1,282	59.2	1,216	53.9	296	79.5	114	45.0
Tulare	506	60.5	473	54.9	145	69.2	50	46.7
Santa Cruz	541	64.7	517	59.8	122	77.6	53	56.5
Marin	3,238	64.0	3,111	59.0	573	80.2	246	54.8
San Luis Obispo	515	67.2	491	62.1	98	82.8	44	55.0
Placer	505	61.6	474	56.6	110	85.9	43	50.7
Merced	527	63.1	490	57.7	159	73.8	50	45.1
Butte	480	66.4	467	61.2	73	78.9	37	56.1
Shasta	520	68.8	502	64.2	106	89.5	45	50.7
Yolo	505	64.7	479	59.5	125	73.4	59	61.5
El Dorado	481	64.0	459	60.7	110	77.7	39	59.4
Imperial	450	59.5	426	55.5	122	68.5	59	49.5
Napa	506	63.0	477	56.8	101	81.0	32	41.8
Kings	514	60.6	469	52.6	178	81.4	50	46.8
Madera	503	61.3	478	56.3	114	80.1	46	58.8
Monterey	573	59.0	539	53.2	152	76.7	59	46.5
Humboldt	851	70.1	822	64.9	151	84.1	69	44.2
Nevada	419	69.5	403	64.0	67	72.7	34	48.9
Mendocino	428	68.8	417	66.6	79	84.6	31	59.4
Sutter	401	59.7	385	56.3	92	79.3	43	62.0
Yuba	412	67.1	378	59.6	117	79.8	45	57.7

Table 6-2. Number of completed extended interviews and response rates by sampling stratum and type of interview (Continued)

	Household		Adult		Child		Adolescent	
	Complete	Response rate	Complete	Response rate	Complete	Response rate	Complete	Response rate
Lake	404	64.0	384	58.4	59	64.5	32	52.6
San Benito	380	54.1	351	48.0	113	67.5	54	58.3
Colusa, Glenn, Tehama	434	67.8	412	63.9	100	78.1	38	54.2
Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, Trinity	393	70.9	383	67.7	75	90.8	34	61.8
Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, Tuolumne	409	65.8	397	61.8	59	82.1	26	49.7

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

Table 6-3. Adult response rates by characteristics of the sampled adult

Characteristic	Response rate
Total	54.0
Sex	
Male	48.2
Female	59.4
Age	
18 to 30 years	46.2
31 to 45 years	51.7
46 to 65 years	56.9
Over 65 years	62.6
Type of household	
With somebody less than 18 years old	50.5
Without somebody less than 18 years old	56.8
Number of adults in household	
1	68.9
2	56.0
3 or more	46.4
Adult was screener respondent	
Yes	69.1
No	39.0

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

Adults in households with fewer adults were more likely to respond than adults in households with more adults. This result is consistent with early cycles. One possible explanation is that in smaller households the person completing the screening interview is more likely to be the sampled adult and, as discussed above, adults completing the screening interview are more likely to complete the extended interview than other adults. To examine this we computed extended adult response rates by the number of adults in the household and whether the sampled adult was the screener respondent. Controlling for screener respondent status accounts for most of the differences in response rates. When the screener respondent is the sampled adult, the response rate was 68.9 percent for one-adult households, 70.2 percent for two adult households and 66.4 percent in three adult households. When the screener respondent is not the sampled adult, the response rate was 40.4 percent in two adult households and 37.7 percent in three adult households. This clearly shows that the screener respondent status is a powerful determinant of the extended response rate.

Now, we examine the child extended interview response rates. Overall, Table 6-2 shows that the child-level response rate is 75.2 percent, which is relatively high but still about six percentage points lower than it was in CHIS 2003. The median rate in the more populous counties (76.9 percent) is two percentage points lower than the rate in smaller counties (78.9 percent).

Table 6-4 gives the child response rates by the characteristics of the child and household using data collected in the adult interview where the children were enumerated for sampling. The child rates do not show much variation by sex, age, or number of children in the household. *CHIS 2005 Methodology Series; Report 2 – Data Collection Methods* contains more detail on these rates.

Table 6-4. Child response rates by characteristics of the sampled child

Characteristic	Response rate
Total	75.2
Sex	
Male	74.7
Female	75.6
Age	
Less than 4 years	76.1
4 to 7 years	74.3
8 to 11 years	75.1

Table 6-4. Child response rates by characteristics of the sampled child (Continued)

Characteristic	Response rate
Number of children in household	
1	74.6
2	75.4
3	74.7
4 or more	77.0

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

The last person-level response rates presented are for the adolescent interview. An important fact to remember is that the adolescent could not be interviewed unless a parent or guardian gave verbal permission to conduct the interview. This requirement means that we had to contact and get permission from the parent or guardian and then contact and interview the adolescent. Consequently, response rates for the adolescent instrument are lower than for the child instrument. Table 6-2 shows the state-level adolescent response rate is 48.5 percent. If we exclude the nonresponse due to parents not giving permission to interview the adolescent, the cooperation rate rises 29 percentage points to 77.5 percent.

As with the adult and child interviews, there are differences in response rates for the adolescent interview by the size of the county. The more heavily populated counties have a median response rate of 49.4 percent and the counties with less than 500,000 persons have a median response rate of 54.0 percent. Table 6-5 gives the adolescent response rates by the characteristics of the adolescent and household based on data collected in the adult interview. These rates, like the corresponding child rates, have little variation across sex, age, and the number of adolescents in the household. The one exception is the rate for males is slightly lower than for females.

To better understand the success rate for interviewing adolescents, we examine the response rates for the adolescent interview including only those adolescents the parents gave permission to interview. This rate is indicative of the ability of the survey operations to contact and interview the adolescents. These rates are given in Table 6-6 which is similar to Table 6-5 but excludes the sampled adolescents without parental permission from the denominator of the response rate computation. Even though the rates in Table 6-6 are 29 percentage points higher than those in Table 6-5, the respective rates by the characteristics are relatively consistent across the tables with a couple of exceptions. One noticeable difference is the drop in the rate for households with older adolescents (15 to 17 years). The lower rate for older adolescents is probably a function of older adolescents being harder to contact and less likely to cooperate. On the other hand, parents are less likely to give permission for younger

adolescents to be interviewed, so the combined rates shown in Table 6-5 are nearly identical for the two age groups.

Table 6-5. Adolescent response rates, by characteristics of the sampled adolescent

Characteristic	Response rate
Total	48.5
Sex	
Male	45.6
Female	51.6
Age	
12 to 14 years	48.6
15 to 17 years	48.4
Number of adolescents in household	
1	48.3
2	48.5
3 or more	49.5

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

Table 6-6. Adolescent cooperation rates excluding parental permission nonresponse by characteristics of the sampled adolescent

Characteristic	Response rate
Total	77.5
Sex	
Male	74.7
Female	80.4
Age	
12 to 14 years	80.0
15 to 17 years	74.9
Number of adolescents in household	
1	78.3
2	76.1
3 or more	78.7

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

Differences in response rates can lead to nonresponse bias as suggested in equation (1). To reduce this potential for bias, geographic and demographic characteristics examined in Tables 6-1 through 6-6 were taken into account in the development of the weights as described in *CHIS 2005 Methodology Series: Report 5 – Weighting and Variance Estimation*. For example, nonresponse adjustments were done separately by county, thus accounting for the differences noted above by the size and urbanicity of the counties. In addition, the weights were also adjusted to be consistent with data from the control totals to reduce residual biases.

6.3 Overall Response Rates

This section presents the overall, or unconditional, response rates for the household and for the adult, child, and adolescent interviews. Table 6-7 gives these response rates for the entire state and by county. As discussed in Chapter 5, the overall rates are the product of screener and extended response rates. At the household level, the overall household response rate is the screener response rate (from Table 6-1) multiplied by the household response rate (from Table 6-2). This rate is computed using equation (9). The adult response rates are computed using equation (10). The child and adolescent overall rates are computed using equation (11) and (12), respectively.

Since the response rates in these tables are the product of two or more interview-level rates, the previously described issues regarding the differences in response rates by county, type of household, and characteristic of the sampled person also apply here. The overall adult response rate is 6.6 percentage points lower than it was in CHIS 2003.

Table 6-7. Overall response rates by sampling stratum and type of interview

Strata	Household	Adult	Child	Adolescent
State total	29.6	26.9	25.2	14.2
Los Angeles	26.0	23.6	21.5	11.6
San Diego	28.2	25.7	23.9	12.9
Orange	26.4	23.8	22.2	12.4
Santa Clara	27.7	25.6	25.2	15.2
San Bernardino	31.4	28.6	28.3	15.9
Riverside	30.5	27.4	26.7	15.5
Alameda	31.5	29.2	26.6	14.3
Sacramento	33.5	30.7	30.4	18.9
Contra Costa	33.7	30.7	31.4	17.4
Fresno	34.4	31.5	30.4	17.9
San Francisco	26.3	24.1	20.3	11.2
Ventura	28.6	25.9	25.2	11.7
San Mateo	29.5	26.6	24.5	15.0
Kern	31.7	28.7	27.0	18.7
San Joaquin	33.0	29.4	28.7	14.4
Sonoma	34.7	32.8	30.4	17.6
Stanislaus	35.3	31.8	27.8	18.0
Santa Barbara	30.1	27.9	27.1	16.8
Solano	30.6	27.9	28.0	13.6
Tulare	34.8	31.6	27.1	16.2
Santa Cruz	35.9	33.1	32.3	18.7
Marin	31.4	28.9	29.1	16.6

Table 6-7. Overall response rates by sampling stratum and type of interview (continued)

Strata	Household	Adult	Child	Adolescent
San Luis Obispo	37.8	35.0	36.2	19.0
Placer	32.3	29.8	31.8	15.6
Merced	34.8	31.8	29.4	15.5
Butte	40.1	36.9	36.2	23.3
Shasta	42.5	39.7	42.5	21.7
Yolo	36.4	33.5	29.7	23.0
El Dorado	34.7	33.0	33.0	19.1
Imperial	30.5	28.5	25.3	16.2
Napa	29.8	26.9	25.5	12.9
Kings	35.6	30.9	34.8	15.5
Madera	35.2	32.4	31.2	21.7
Monterey	28.0	25.2	22.5	14.7
Humboldt	42.7	39.6	36.0	18.5
Nevada	37.3	34.3	25.9	15.5
Mendocino	35.5	34.4	33.4	19.5
Sutter	33.1	31.2	32.2	19.9
Yuba	38.5	34.2	37.4	21.8
Lake	35.1	32.0	26.1	21.0
San Benito	29.6	26.3	23.4	19.0
Colusa, Glenn, Tehama	38.8	36.6	31.6	20.3
Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, Trinity	42.8	40.9	46.6	24.2
Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, Tuolumne	34.8	32.7	33.2	17.6

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

7. DISCUSSION OF RESPONSE RATES

In this chapter, we discuss the response rates from CHIS 2005 in the context of procedures used to increase response rates and how these rates compare to those from other RDD surveys. The first section briefly reviews some of the methods used in CHIS 2005 that effect response rates, mentioned in Chapter 4. A more complete discussion of these methods is provided in *CHIS 2005 Methodology Series: Report 2 – Data Collection Methods*. The response rates obtained in CHIS 2005 are then compared to rates from other surveys. Earlier reports, the *CHIS 2001 Methodology Series: Report 4 – Response Rates* (UCLA Center for Health Policy Research, 2002) and *CHIS 2003 Methodology Series: Report 4 – Response Rates* (UCLA Center for Health Policy Research, 2005), contain many comparisons to other surveys, so this review is limited to new RDD surveys that have been conducted in California.

7.1 Methods to Enhance Response Rates

A number of methods to enhance response rates have been used in all three cycles of CHIS, although the details of how they were implemented may have changed over time, and other methods were only used in some of the cycles. The specifics of these methods can be found in *CHIS 2005 Methodology Series: Report 2 – Data Collection Method*. We summarize them here to provide some context for the CHIS 2005 response rates.

One issue that has been the topic of considerable discussion in the RDD literature is the method of selecting adults within a household. Beginning in CHIS 2003 we have used the method proposed by Rizzo et. al. (2004) because it enables us to bypass the enumeration of adult household members in most households. This sample selection procedure not only is less intrusive but also results in a valid probability sample that is not obtained by some of the alternative selection methods. The specifics of this sampling algorithm are described in *CHIS 2005 Methodology Series: Report 1 – Sample Design*.

The child-first procedure was implemented in CHIS 2005 with the express intent of increasing the yield and response rates for the child interviews. While the outcomes of the child-first approach are examined in detail in *CHIS 2005 Methodology Series: Report 1 – Sample Design*, it is clear that the procedure increased both the yield and response rates for the child interviews. Its effect on the adult response rates is less clear, but it is likely that the adult response rates were suppressed slightly by using this approach.

As in previous cycles of CHIS, a variety of interviewer training methods were developed and implemented to increase response rates. Since these methods were applied to all interviewers, no evaluation of the methods in terms of response rate improvement is available. Each interviewer was given the full set of training along with special training to help them to avoid refusals. Interviewers assigned to refusal conversion cases were also given special training before they were permitted to make contact with households or persons who previously refused.

Another method used to increase response rates in CHIS 2005 was an advance mailing sent to all sampled cases with mailable addresses identified from vendors. As in the past, the advance letter mailing appears to have increased response rates slightly. While no experimental data exist to support the effect of mailings in CHIS 2005, the data summarized in Table 7-1 showing higher response rates by whether an advance letter was mailed are consistent with experiments from other studies.

Table 7-1. Interview response rates by type of interview and advance letter

	Advance letter mailed		
Type	Yes	No	Difference
Screener	52.3	40.1	+12.2
Adult interview	55.0	50.0	+5.0
Child interview	75.8	73.3	+2.5
Adolescent interview	50.6	40.8	+9.8
Household extended	60.2	55.6	+4.6

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

The advance mailings in CHIS 2005 were different from earlier cycles because experiments on the use of prepaid monetary incentives and sponsorship were embedded in the survey. *CHIS 2005 Methodology Series: Report 2 – Data Collection Methods* gives the full details on the effectiveness of the incentives and sponsors. In general, the inclusion of $2 in the advance mailing did increase response rates in the survey.

Other methods for enhancing response rates in CHIS 2005 include:

- Repeated Call Attempts: The procedures implemented in CHIS 2005 allowed many attempts to severely limit the bias from this source of nonresponse. Most interviews were completed within a few call attempts, and the median number of call attempts for a completed screener is three and for the adult interview is two. However, each distribution has a long tail (the 75th percentile of the number of completed screeners is the sixth attempt).

- Refusal Conversion: An effective method of increasing response rates in an RDD survey is to recontact households and persons who refuse to participate in the initial interview and to ask them to reconsider and complete the interview. In CHIS 2001, attempts for refusal conversion were implemented for all screener nonrespondents. In CHIS 2005, these procedures were implemented in a random subsample of 60 percent of the sample that was assigned during sample selection. If a household refused but was not selected for the subsample, no further calls were made to convert it. Hansen and Hurwitz (1946) originally proposed this idea, and Srinath (1971) and Elliott, Little, and Lewitzky (2000) examined its use more recently. Due to refusal conversion subsampling, weighted response rates were computed in order to reflect the subsampling of cases that were converted.

- Proxy Reporting: As in previous cycles, proxy respondents could report for sampled adults who were over 65 and unable to participate because of mental or physical disabilities. No other types of proxy interviews were permitted in CHIS 2005. A total of 139 adult proxy interviews were done in the RDD sample. Proxy respondents had to be adult household members who were knowledgeable about the sampled person's health. The proxy respondent was almost always a spouse or child of the sampled adult. While the number of interviews completed using the proxy interviews is relatively small, it does provide coverage for a group of adults with very different health characteristics that would not otherwise be included in the survey.

- In-Language Interviews: A very important procedure incorporated to enhance the response rate in CHIS 2005 and previous cycles was conducting the interviews in the language requested by the sampled person. The languages included were: Spanish, Chinese (Cantonese and Mandarin), Korean, and Vietnamese. In many cases, households that did not speak English would not have been included in CHIS had it not been for the additional languages. In some cases, the respondents would have tried to respond in English but the quality of the interviews would have been much lower if the other languages were not provided. The translation of the instruments provides a common basis for the interviewers that would not be available otherwise. Table 7-2 gives the number of interviews that were completed by language. More than 10,000 households completed the screener using a language other than English, accounting for about 12 percent of all the completed interviews in CHIS 2005. Spanish is the most frequently used language, with about 80 percent of the non-English screeners being completed in Spanish. Korean was the second most frequently used language in the interviews. The effects on the bias associated with this effort are described in Lee, Kurata, Nguyen, and Jawad (2006).

Table 7-2. Number of completed interviews by language and sample type

Sample Type	English	Non-English	Spanish	Korean	Vietnamese	Cantonese	Mandarin	Total
Screener								
Total	64,469	9,345	7,141	641	736	419	408	73,814
RDD	64,305	8,895	7,141	442	489	416	407	73,200
Korean	47	114	0	1	113	0	0	161
Vietnamese	57	148	0	145	0	2	1	205
Korean & Vietnamese	60	188	0	53	134	1	0	248
Adult								
Total	38,485	4,535	3,141	371	430	285	308	43,020
RDD	38,418	4,324	3,141	286	304	285	308	42,742
Korean	20	64	0	1	63	0	0	84
Vietnamese	20	59	0	59	0	0	0	79
Korean & Vietnamese	27	88	0	25	63	0	0	115
Child								
Total	9,307	2,051	1,717	81	123	55	75	11,358
RDD	9,280	1,996	1,717	62	87	55	75	11,276
Korean	6	16	0	0	16	0	0	22
Vietnamese	7	15	0	15	0	0	0	22
Korean & Vietnamese	14	24	0	4	20	0	0	38
Permission								
Total	4,854	1,130	928	49	66	44	43	5,984
RDD	4,846	1,104	928	40	50	43	43	5,950
Korean	0	10	0	0	10	0	0	10
Vietnamese	3	6	0	5	0	1	0	9
Korean & Vietnamese	5	10	0	4	6	0	0	15
Adolescent								
Total	3,739	290	258	12	5	2	13	4,029
RDD	3,724	285	258	10	3	1	13	4,009
Korean	5	1	0	0	1	0	0	6
Vietnamese	4	2	0	1	0	1	0	6
Korean & Vietnamese	6	2	0	1	1	0	0	8

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

7.2 Comparisons of Response Rates over the Cycles

While the sampling and content varies somewhat across CHIS 2005, 2003, and 2001, the survey procedures are very similar. One adult is sampled from each household and asked to complete a interview of about 30 minutes. Other household members are sampled and interviewed if there are children and/or adolescents present in the household. The response disposition codes and formulas used to compute the response rates in CHIS 2005 are similar to the ones used in 2001 and 2003, although the child-first procedures have some implications for the response rates in 2005 as noted earlier.

Table 7-3 summarizes the screener interview, extended interview, and overall response rates by cycle. The state-level response rates declined from 2001 to 2005, with overall response rates decreasing between 5 and 17 percentage points. The decrease in response rate between 2003 and 2005 was between 2 and 9 percent. This level of decrease in response rates is consistent with the decline in RDD response rates observed by Curtin, Presser, and Singer (2003). Some of this downward trend could be explained by the increase in refusal rates following September 11, 2001 (DiSogra et al. 2003). Appendix A provides tables showing the rates for each stratum from 2001, 2003, and 2005.

Table 7-3. Comparison of state-level response rates between CHIS 2001, 2003 and 2005

Type	2001	2003	2005
Screener Interview	59.2	55.9	49.8
Extended Interview			
Household[1]	-	-	59.3
Adult	63.7	59.9	54.0
Child	87.6	81.4	75.2
Adolescent	63.5	57.3	48.5
Adolescent[2]	84.5	83.3	77.5
Overall			
Household	-	-	29.6
Adult	37.7	33.5	26.9
Child	33.0	27.3	25.2[3]
Adolescent	23.9	19.2	14.2[3]

[1] Available in 2005 only.

[2]Adolescent response rate with cases where permission was not granted removed from the denominator

[3]Overall response rate computation reflects the effect of the use of child first procedures.

Source: UCLA Center for Health Policy Research, 2005 California Health Interview Survey.

7.3 Comparisons of Response Rates with Other RDD Surveys

In this section we compare the response rates from CHIS 2005 to those from other RDD surveys from the adult population in California. These comparisons are not direct because other surveys may differ in terms of the sampling methods, the types of persons selected for the interview, the length of interview, and other factors. A more generic reason for the difficulty of comparisons to other surveys has to do with the lack of detailed information on disposition codes available for most RDD surveys conducted in the United States as noted in several places, such as by McCarthy (2003). Publications with definitions of response rates by AAPOR (2006) are attempts to address this problem. This section includes only RDD surveys conducted in California after 2004. Earlier reports covered those conducted prior to 2004.

One RDD survey that has been compared to each cycle of CHIS is the California Behavioral Risk Factor Surveillance System (BRFSS). This is an annual survey conducted in each state as a cooperative venture with the Centers for Disease Control and Prevention (CDC). The information on the 2005 BRFSS is available from the CDC web site. In the BRFSS, one adult in each household is sampled and asked to complete a core interview of about 20 minutes on health-related topics. The BRFSS core interview is about 15 minutes shorter than CHIS 2005 and does not have multiple interviews within the household. Nonetheless, it is probably more similar to CHIS than any other survey.

The CDC Summary Data Quality Report (2006) gives response rates for the 2005 BRFSS. The CDC report for the survey shows detailed disposition codes, very much in the spirit of the AAPOR (2006) recommendations. Despite the detail given, it is very difficult to map the 2005 California BRFSS disposition codes unambiguously to the corresponding disposition codes used in CHIS 2005 because different survey organizations use different classification schemes to create the disposition codes. The codes from both systems provide much needed information for the conduct of the operations of the survey, but they are not the same. This difference highlights the difficulty of making direct comparisons between surveys.

Several cooperation and response rates are reported for the 2005 California BRFSS in Table 6 of the CDC Quality Report. The BRFSS response rate that is closest to the definition used in CHIS is the overall response rate (the CHIS rate is more conservative than this because it assumes that all likely households contain eligible adults rather than the 98 percent assumed in the BRFSS computation). For 2005, the overall response rate is 29.2 percent for California. This response rate is almost identical to the CHIS 2005 overall household response rate. The overall rates for the two surveys are not very different, especially given the potential discrepancies in the definitions and methods.

We are aware of two other surveys conducted in California in the 2005/2006 time frame that could be compared to CHIS 2005. One is the California Tobacco Study (CTS) undertaken by the University of California at San Diego with data collection conducted by Westat. This study has many design differences from the CHIS. The study collects data from a household respondent about all adults in the household and then samples adults for more in-depth data collection. The household level response rate in the CTS was very similar and just slightly lower than the CHIS 2005 household response rate. (The CTS final methodological reports are not yet completed.) The other study we examined was the California Women's Health Survey (California Department of Health Services, 2006). The California Women's Health Survey (CWHS) is an on-going monthly telephone survey that collects information on a wide variety of health-related behaviors and attitudes from a sample of adult women. They report CASRO

response rates of 25 percent in 2001, 37 percent in 2002, 40 percent in 2003, 41 percent in 2004, and 42 percent in 2005. This pattern of increasing response rates since 2001 is very unusual and the documentation we have been able to locate does not identify any reasons for this pattern. The sampling frame for CWHS also differs from the CHIS, BRFSS, and CTS RDD frames. California Department of Health Services (2006) reports that the CWHS used a screened RDD sample purchased from a commercial sampling firm. It is not clear what its implications are for reporting response rates. We suspect the response rates associated with the screening done by the commercial firm are not included. If this is true, then the CWHS rates are inflated as compared with the other surveys discussed.

APPENDIX A

Table A-1. County screener response rates from CHIS 2001, 2003, and 2005

Stratum	Description	Cycle		
		2001	2003	2005
	State Total	59.2	55.9	49.8
1	Los Angeles	56.9	51.0	46.6
2	San Diego	59.9	56.8	48.1
3	Orange	59.0	54.2	46.8
4	Santa Clara	57.1	57.1	45.7
5	San Bernardino	63.7	61.0	53.7
6	Riverside	62.2	59.1	52.7
7	Alameda	57.6	54.9	49.4
8	Sacramento	61.3	60.3	53.0
9	Contra Costa	57.6	58.8	51.5
10	Fresno	64.0	59.5	57.2
11	San Francisco	50.7	44.2	43.1
12	Ventura	59.4	57.1	52.4
13	San Mateo	53.8	54.6	45.6
14	Kern	68.9	62.9	55.3
15	San Joaquin	64.7	58.1	55.7
16	Sonoma	61.3	56.6	52.4
17	Stanislaus	65.7	61.0	56.5
18	Santa Barbara	62.1	61.0	52.1
19	Solano	61.5	61.9	51.8
20	Tulare	67.7	66.2	57.5
21	Santa Cruz	57.7	57.7	55.4
22	Marin	54.7	54.5	49.0
23	San Luis Obispo	61.6	64.4	56.3
24	Placer	60.3	60.9	52.5
25	Merced	66.2	61.4	55.1
26	Butte	67.3	63.8	60.3
27	Shasta	65.7	63.2	61.8
28	Yolo	66.2	64.4	56.2
29	El Dorado	57.8	59.4	54.3
30	Imperial	67.0	62.0	51.3
31	Napa	59.0	56.4	47.3
32	Kings	65.5	60.1	58.7
33	Madera	67.8	62.2	57.4
34	Monterey*	60.7	58.1	47.5
35	Humboldt*	66.5	64.3	60.9
36	Nevada *	59.5	58.8	53.6
37	Mendocino*	60.9	61.8	51.6
38	Sutter*	66.2	67.3	55.4
39	Yuba*	66.2	67.3	57.3
40	Lake*	60.9	61.8	54.8

Table A-1. County screener response rates from CHIS 2001, 2003, and 2005 (continued)

Stratum	Description	Cycle 2001	2003	2005
41	San Benito*	60.7	58.1	54.8
42	Tehama, Glen, Colusa	68.9	68.0	57.2
43	North Balance*	66.5	65.4	60.5
44	Sierra Balance*	58.0	57.2	53.0

*These strata included other counties in 2001 and 2003.

Source: UCLA Center for Health Policy Research, 2001, 2003 and 2005 California Health Interview Survey.

Table A-2. County adult response rates from CHIS 2001, 2003, and 2005

Stratum	Description	Cycle 2001	2003	2005
	State Total	63.7	60.0	54.0
1	Los Angeles	60.0	55.1	50.5
2	San Diego	63.3	60.7	53.5
3	Orange	60.3	58.0	50.8
4	Santa Clara	61.2	64.3	55.9
5	San Bernardino	64.0	59.5	53.2
6	Riverside	64.7	58.7	52.0
7	Alameda	65.2	62.1	59.2
8	Sacramento	65.7	63.0	58.0
9	Contra Costa	64.9	66.3	59.6
10	Fresno	59.8	61.6	55.0
11	San Francisco	59.1	59.9	55.9
12	Ventura	63.7	60.3	49.5
13	San Mateo	60.4	61.4	58.3
14	Kern	66.6	65.5	51.9
15	San Joaquin	63.7	59.2	52.7
16	Sonoma	67.8	67.0	62.7
17	Stanislaus	64.2	62.4	56.3
18	Santa Barbara	66.1	64.6	53.5
19	Solano	63.9	60.8	53.9
20	Tulare	64.6	64.7	54.9
21	Santa Cruz	68.3	64.0	59.8
22	Marin	70.4	65.2	59.0
23	San Luis Obispo	69.7	64.9	62.1
24	Placer	68.2	63.0	56.6
25	Merced	64.0	57.7	57.7
26	Butte	67.6	69.5	61.2
27	Shasta	69.4	66.7	64.2
28	Yolo	69.3	66.3	59.5
29	El Dorado	67.6	64.4	60.7
30	Imperial	63.5	61.9	55.5
31	Napa	66.6	65.4	56.8
32	Kings	66.6	61.7	52.6
33	Madera	67.3	59.9	56.3
34	Monterey*	62.9	63.1	53.2
35	Humboldt*	69.6	71.0	64.9
36	Nevada *	70.5	66.1	64.0

Table A-2. County adult response rates from CHIS 2001, 2003, and 2005 (continued)

Stratum	Description	Cycle 2001	2003	2005
37	Mendocino*	68.6	67.8	66.6
38	Sutter*	64.6	64.7	56.3
39	Yuba*	64.6	64.7	59.6
40	Lake*	68.6	67.8	58.4
41	San Benito*	62.9	63.1	48.0
42	Tehama, Glen, Colusa	65.9	63.0	63.9
43	North Balance*	69.6	72.3	67.7
44	Sierra Balance*	72.4	69.1	61.8

*These strata included other counties in 2001 and 2003.

Source: UCLA Center for Health Policy Research, 2001, 2003 and 2005 California Health Interview Survey.

Table A-3. County child response rates from CHIS 2001 and CHIS 2005

Stratum	Description	Cycle 2001	2003	2005
	State Total	87.6	81.4	75.2
1	Los Angeles	83.7	80.2	72.1
2	San Diego	88.5	84.2	74.8
3	Orange	84.5	77.5	73.1
4	Santa Clara	92.2	80.7	77.6
5	San Bernardino	91.2	80.3	76.9
6	Riverside	90.8	83.2	73.2
7	Alameda	90.3	81.1	75.6
8	Sacramento	86.3	77.8	78.3
9	Contra Costa	88.9	79.7	80.7
10	Fresno	88.9	86.2	79.9
11	San Francisco	88.5	79.4	73.2
12	Ventura	85.4	88.7	78.6
13	San Mateo	84.5	80.6	76.3
14	Kern	89.2	79.9	79.7
15	San Joaquin	89.9	86.7	78.5
16	Sonoma	95.0	91.1	78.1
17	Stanislaus	85.8	84.7	67.1
18	Santa Barbara	89.7	86.2	76.7
19	Solano	87.0	73.3	79.5
20	Tulare	91.0	77.2	69.2
21	Santa Cruz	88.6	80.2	77.6
22	Marin	89.1	88.3	80.2
23	San Luis Obispo	93.1	87.6	82.8
24	Placer	90.5	79.4	85.9
25	Merced	86.7	80.9	73.8
26	Butte	89.6	93.2	78.9
27	Shasta	87.0	86.9	89.5
28	Yolo	95.2	82.1	73.4
29	El Dorado	92.5	81.6	77.7
30	Imperial	82.4	72.1	68.5
31	Napa	84.0	89.1	81.0
32	Kings	89.5	88.2	81.4

Table A-3. County child response rates from CHIS 2001 and CHIS 2005 (continued)

Stratum	Description	Cycle 2001	2003	2005
33	Madera	85.6	85.1	80.1
34	Monterey*	87.2	81.8	76.7
35	Humboldt*	92.9	84.9	84.1
36	Nevada *	90.0	82.0	72.7
37	Mendocino*	87.8	87.5	84.6
38	Sutter*	90.4	92.1	79.3
39	Yuba*	90.4	92.1	79.8
40	Lake*	87.8	87.5	64.5
41	San Benito*	87.2	81.8	67.5
42	Tehama, Glen, Colusa	90.7	80.0	78.1
43	North Balance*	96.1	92.0	90.8
44	Sierra Balance*	93.7	89.8	82.1

*These strata included other counties in 2001 and 2003.

Source: UCLA Center for Health Policy Research, 2001, 2003 and 2005 California Health Interview Survey.

Table A-4. County adolescent response rates from CHIS 2001 and CHIS 2005

Stratum	Description	Cycle 2001	2003	2005
	State Total	63.5	57.3	48.5
1	Los Angeles	58.5	56.5	43.8
2	San Diego	62.1	59.8	46.8
3	Orange	52.3	49.1	47.9
4	Santa Clara	60.1	60.0	53.6
5	San Bernardino	68.0	55.4	50.0
6	Riverside	64.8	55.2	49.4
7	Alameda	57.9	56.2	45.3
8	Sacramento	65.3	53.3	55.9
9	Contra Costa	64.1	64.8	53.6
10	Fresno	64.3	57.5	51.8
11	San Francisco	51.4	58.0	46.2
12	Ventura	60.6	60.8	46.9
13	San Mateo	65.0	51.1	52.6
14	Kern	66.2	58.1	57.9
15	San Joaquin	65.7	52.3	48.9
16	Sonoma	65.3	56.7	48.9
17	Stanislaus	60.7	60.9	54.0
18	Santa Barbara	63.2	67.3	59.6
19	Solano	65.6	60.3	45.0
20	Tulare	63.7	62.4	46.7
21	Santa Cruz	70.5	68.6	56.5
22	Marin	61.2	58.4	54.8
23	San Luis Obispo	65.0	63.0	55.0
24	Placer	70.1	67.0	50.7
25	Merced	65.2	64.8	45.1
26	Butte	64.5	60.7	56.1
27	Shasta	63.2	54.5	50.7
28	Yolo	68.8	58.7	61.5

Table A-4. County adolescent response rates from CHIS 2001 and CHIS 2005 (continued)

Stratum	Description	Cycle		
		2001	2003	2005
29	El Dorado	74.2	57.9	59.4
30	Imperial	70.6	66.4	49.5
31	Napa	61.1	68.5	41.8
32	Kings	70.1	64.4	46.8
33	Madera	70.4	68.6	58.8
34	Monterey*	66.4	56.0	46.5
35	Humboldt*	69.1	60.9	44.2
36	Nevada *	78.8	72.0	48.9
37	Mendocino*	67.9	62.4	59.4
38	Sutter*	65.9	70.8	62.0
39	Yuba*	65.9	70.8	57.7
40	Lake*	67.9	62.4	52.6
41	San Benito*	66.4	56.0	58.3
42	Tehama, Glen, Colusa	70.4	57.0	54.2
43	North Balance*	68.1	69.7	61.8
44	Sierra Balance*	75.2	62.5	49.7

*These strata included other counties in 2001 and 2003.

Source: UCLA Center for Health Policy Research, 2001, 2003 and 2005 California Health Interview Survey.

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