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CHIS 2011-2012 Methodology Report Series

Report 4

Response Rates

CALIFORNIA HEALTH INTERVIEW SURVEY

CHIS 2011-2012 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 2011-2012. 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 2011-2012 California Health Interview Survey (CHIS 2011-2012). The other reports are listed below. A similar set of reports is available for each previous CHIS cycle.

CHIS is a collaborative project of the University of California, Los Angeles (UCLA) Center for Health Policy Research, the California Department of Public Health, and the Department of Health Care Services. Westat was responsible for data collection and the preparation of five methodological reports from the 2011-2012 survey. The survey examines public health and health care access issues in California. The telephone survey is the largest state health survey ever undertaken in the United States.

Methodological Report Series for CHIS 2011-2012

The methodological reports for the CHIS 2011-2012 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. After the Preface, each report includes an “Overview” chapter ([Chapter 1](#)) that is nearly identical across reports, followed by detailed technical documentation on the specific topic of the report.

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 improve response. The specific operational methods are described more completely in *CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods*. These methods are summarized briefly to provide some context for the examination in this report.

For further methodological details not covered in this report, refer to the other methodological reports in the series at <http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx>. General information on CHIS data can be found on the California Health Interview Survey Web site at <http://www.chis.ucla.edu> or by contacting CHIS at CHIS@ucla.edu.

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1. CHIS 2011-2012 SAMPLE DESIGN AND METHODOLOGY SUMMARY

1.1 Overview

The California Health Interview Survey (CHIS) is a population-based telephone survey of California conducted every other year since 2001 and continually beginning in 2011. CHIS is the largest state health survey conducted and one of the largest health surveys in the nation. CHIS is conducted by the UCLA Center for Health Policy Research (UCLA-CHPR) in collaboration with the California Department of Public Health, the Department of Health Care Services, First 5 California, The California Endowment, the National Cancer Institute, and Kaiser Permanente. 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 objectives:

- 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 Asian and Latino ethnic subgroups.

The CHIS sample is representative of California's non-institutionalized population living in households. 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. These data are 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. Many researchers throughout California and the nation use CHIS data files to further their understanding of a wide range of health-related issues (visit the CHIS Research Clearinghouse at <http://healthpolicy.ucla.edu/chis/research/Pages/default.aspx> for many examples of these studies).

This series of reports describes the methods used in collecting data for CHIS 2011-2012, the sixth CHIS data collection cycle, which was conducted between June 2011 and January 2013. The previous CHIS cycles (2001, 2003, 2005, 2007, and 2009) are described in similar series, available at <http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx>.

1.2 Switch to a Continuous Survey

From the first CHIS cycle in 2001 through 2009, CHIS data collection was biennial, with data collected during a 7-9 month period every other year. Beginning in 2011, CHIS data are collected continually over each 2-year cycle. This change was driven by several factors including the ability to track and release information about health in California on a more frequent and timely basis and to eliminate potential seasonality in the biennial data.

The CHIS 2011-2012 data included in these files were collected between June 2011 and January 2013. Approximately half of the interviews were conducted during the 2011 calendar year and half during the 2012 calendar year. As in previous CHIS cycles, weights are included with the data files and are based on the State of California's Department of Finance population estimates and projections, adjusted to remove the population living in group quarters (such as nursing homes, prisons, etc. and not eligible to participate in CHIS). When the weights are applied to the data, the results represent California's residential population during that one year period for the age group corresponding to the data file in use (adult, adolescent, or child).

See what else is new in the 2011-2012 CHIS sampling and data collection here: <http://healthpolicy.ucla.edu/chis/design/Documents/whats-new-chis-2011-2012.pdf>

In order to provide CHIS data users with more complete and up-to-date information to facilitate analyses of CHIS data, additional information on how to use the CHIS sampling weights, including sample code, is available at: <http://healthpolicy.ucla.edu/chis/analyze/Pages/sample-code.aspx>

Additional documentation on constructing the CHIS sampling weights is available in CHIS 2011-2012 Methods Report 5 – Weighting and Variance Estimation, available at: <http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx>. Other helpful information for understanding the CHIS sample design and data collection processing can be found in the four other methodology reports for each CHIS cycle year, described in the Preface above.

1.3 Sample Design Objectives

The CHIS 2011-2012 sample was designed to meet two sampling objectives discussed above: (1) provide estimates for adults in most counties and groups of counties with small populations; and (2) provide estimates for California's overall population, major racial and ethnic groups, and for several smaller ethnic subgroups.

To achieve these objectives, CHIS employed a dual-frame, multi-stage sample design. The random-digit-dial (RDD) sample included telephone numbers assigned to both landline and cellular service. The random-digit-dial (RDD) sample was approximately 80% landline and 20% cellular phone numbers. For the landline RDD sample, the 58 counties in the state were grouped into 44 geographic sampling strata, and 14 sub-strata were created within two of the largest metropolitan areas in the state (Los Angeles and San Diego). The Los Angeles County stratum included 8 sub-strata for Service Planning Areas, and the San Diego County stratum included 6 sub-strata for Health Service Regions. Most of the strata (39 of 44) are made up of a single county with no sub-strata (counties 3-41 in Table 1-1), with three multi-county strata comprised of the 17 remaining counties (see Table 1-1). A sufficient number of adult interviews were allocated to each stratum and sub-stratum to support the first sample design objective—to provide health estimates for adults at the local level. The same geographic stratification of the state has been used since CHIS 2005. In the first two CHIS cycles (2001 and 2003) there were 47 total sampling strata, including 33 individual counties and one county with sub-strata (Los Angeles).

Within each geographic stratum, residential telephone numbers were selected, 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.

The RDD CHIS sample is of sufficient size to accomplish the second objective (produce estimates for the state's major racial/ethnic groups, as well as many ethnic subgroups). 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.

Table 1-1. California county and county group strata used in the CHIS 2011-2012 sample design

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

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

To help compensate for the increasing number of households without landline telephone service, a separate RDD sample was drawn of telephone numbers assigned to cellular service. In CHIS 2011-2012, the goal was to complete approximately 8,000 interviews (20% of all RDD interviews statewide) with adults from the cell phone sample. Telephone numbers assigned to cellular service cannot be geographically stratified at the county level with sufficient precision, so the cell RDD sample was geographically stratified into 28 strata using 7 CHIS regions and telephone area codes. If a sampled cell number was shared by two or more adult members of a household, one household member was selected for the adult interview. Otherwise, the adult owner of the sampled number was selected. Cell numbers used exclusively by children under 18 were considered ineligible. About 550 teen interviews and 1,500 child interviews were completed from the cell phone sample in CHIS 2011-2012.

The CHIS 2011-2012 and 2009 cell phone sampling method differed from that used in CHIS 2007 in two significant ways. First, in CHIS 2011-2012, all cell phone sample numbers used for non-business purposes by adults living in California were eligible for the extended interview, while in 2007 only cell numbers belonging to adults in cell-only households were eligible. Thus, adults in households with landlines who had their own cell phones or shared one with another adult household member could

have been selected through either the cell or landline sample. The second change to the cell phone sample was the inclusion of child and adolescent extended interviews.

Unlike both CHIS 2007 and CHIS 2009, where the cell phone sample quotas were treated separately from the landline sample, the CHIS 2011-2012 cell sample respondents were included in the overall and county specific target sample sizes. Twenty-eight cell phone sampling strata were created using CHIS 2007 and 2009 cell phone respondents' data and their pre-assigned FIPS county code, supplied by the sampling vendor. The statewide target of 8,000 adult cell phone interviews was also supplemented with an oversample to yield approximately 1,150 adult cell phone interviews. The oversample focused on six counties; Los Angeles, Orange, Santa Clara, Alameda, San Francisco, and San Mateo.

Finally, the CHIS 2011-2012 sample included an American Indian/Alaska Native (AIAN) oversample. This oversample was sponsored by Urban American Indian Involvement, Inc., and California Indian Health Services. The purpose of this oversample was to increase the number of AIAN participants and improve the statistical stability and precision of estimates for this group. The oversample was conducted using a list provided by Indian Health Services.

1.4 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 CHIS 2011-2012 data collection under contract with the UCLA Center for Health Policy Research. For all samples, Westat staff interviewed one randomly selected adult in each sampled household, and sampled one adolescent and one child if they were present in the household and the sampled adult was the parent or legal guardian. Thus, up to three interviews could have been completed in each household. In landline sample 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 has been continued in subsequent CHIS cycles; this

procedure substantially increases the yield of child interviews. While numerous subsequent attempts were made to complete the adult interview child-first cases, there are 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 2011-2012 by the type of sample (landline RDD, surname list, cell RDD, and American Indian/Alaska Native list).

Table 1-2. Number of completed CHIS 2011-2012 interviews by type of sample and instrument

Type of sample	Adult	Child	Adolescent
Total all samples	42,935 ¹	7,334	2,799
Landline RDD	32,692	5,600	2,164
Surname list	825	161	57
Cell RDD	9,151	1,523	557
American Indian/Alaska Native list	267	50	21

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Interviews in all languages were administered using Westat’s computer-assisted telephone interviewing (CATI) system. The average adult interview took about 35 minutes to complete. The average child and adolescent interviews took about 15 minutes and 23 minutes, respectively. For “child-first” interviews, additional household information asked as part of the child interview averaged about 9 minutes. Interviews in non-English languages generally took longer to complete. More than 14 percent of the adult interviews were completed in a language other than English, as were about 27 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 Numbers in this table represent the data publically released and available through our Data Access Center. Total sample sizes may differ for specific calculations within the five methodology reports, or for specific analyses based on CHIS data.

Table 1-3. CHIS 2011-2012 survey topic areas by instrument

Health status	Adult	Teen	Child
General health status	✓	✓	✓
Days missed from school due to health problems	✓	✓	✓
Health-related quality of life (HRQOL)		✓	
Health conditions	Adult	Teen	Child
Asthma	✓	✓	✓
Diabetes, gestational diabetes, pre- /borderline diabetes	✓		
Heart disease, high blood pressure, stroke	✓		
Arthritis, physical disability	✓		
Epilepsy		✓	
Physical, behavioral, and/or mental conditions			✓
Mental health	Adult	Teen	Child
Mental health status	✓	✓	
Perceived need, access and utilization of mental health services	✓	✓	
Functional impairment, stigma	✓		
Suicide ideation and attempts	✓		
Health behaviors	Adult	Teen	Child
Dietary intake, fast food	✓	✓	✓
Physical activity and exercise, commute from school to home		✓	✓
Walking for transportation and leisure	✓		
Doctor discussed nutrition/physical activity		✓	✓
Flu Shot	✓		✓
Alcohol and cigarette use	✓	✓	
Illegal drug use		✓	
Sexual behavior	✓	✓	
HIV/STI testing		✓	
Elderly falls	✓		
Women's health	Adult	Teen	Child
Mammography screening	✓		
Pregnancy	✓	✓	
Dental health	Adult	Teen	Child
Last dental visit, main reason haven't visited dentist		✓	✓
Neighborhood and housing	Adult	Teen	Child
Safety, social cohesion	✓	✓	✓
Homeownership, length of time at current residence	✓		
Park use		✓	✓
Civic engagement	✓	✓	

Table 1-3. CHIS 2011-2012 survey topic areas by instrument (continued)

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 and medical care)	✓	✓	✓
Medical home, timely appointments, hospitalizations	✓	✓	✓
Communication problems with doctor	✓		✓
Internet use for health information	✓		✓
Food environment	Adult	Teen	Child
Access to fresh and affordable foods	✓		
Where teen/child eats breakfast/lunch, fast food at school		✓	✓
Availability of food in household over past 12 months	✓		
Health insurance	Adult	Teen	Child
Current insurance coverage, spouse's coverage, who pays for coverage	✓	✓	✓
Health plan enrollment, characteristics and plan assessment	✓	✓	✓
Whether employer offers coverage, respondent/spouse eligibility	✓		
Coverage over past 12 months, reasons for lack of insurance	✓	✓	✓
Difficulty finding private health insurance	✓		
High deductible health plans	✓	✓	✓
Partial scope Medi-Cal	✓		
Public program eligibility	Adult	Teen	Child
Household poverty level	✓		
Program participation (CalWORKs, Food Stamps, SSI, SSDI, WIC, TANF)	✓	✓	✓
Assets, alimony/child support, social security/pension	✓		
Medi-Cal and Healthy Families eligibility	✓	✓	✓
Reason for Medi-Cal non-participation among potential beneficiaries	✓	✓	✓
Bullying and interpersonal violence	Adult	Teen	Child
Bullying, personal safety, interpersonal violence		✓	
Parental involvement/adult supervision	Adult	Teen	Child
Adult presence after school, role models, resiliency		✓	
Parental involvement			✓
Child care and school attendance	Adult	Teen	Child
Current child care arrangements			✓
Paid child care	✓		
First 5 California: Kit for New Parents			✓
Preschool/school attendance, name of school		✓	✓
Preschool quality			✓
School instability		✓	

Table 1-3. CHIS 2011-2012 survey topic areas by instrument (continued)

Employment	Adult	Teen	Child
Employment status, spouse's employment status	✓		
Hours worked at all jobs	✓		
Income	Adult	Teen	Child
Respondent's and spouse's earnings last month before taxes	✓		
Household income, number of persons supported by household income	✓		
Respondent characteristics	Adult	Teen	Child
Race and ethnicity, age, gender, height, weight	✓	✓	✓
Veteran status	✓		
Marital status, registered domestic partner status (same-sex couples)	✓		
Sexual orientation	✓		
Language spoken with peers, language of TV, radio, newspaper used	✓		
Education, English language proficiency	✓		
Citizenship, immigration status, country of birth, length of time in U.S., languages spoken at home	✓	✓	✓

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

1.5 Response Rates

The overall response rate for CHIS 2011-2012 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 landline sampled telephone numbers for which an address could be obtained from reverse directory services. An advance letter was mailed for 48.3 percent of the landline RDD sample telephone numbers not identified by the sample vendor as business or nonworking numbers, 81.1 percent of surname list sample numbers, and 94.3 percent of the AIAN list with landline numbers after removing nonworking and business numbers. Addresses were not available for the cell sample. As in all CHIS cycles since CHIS 2005, a \$2 bill was included with the CHIS 2011-2012 advance letter to encourage cooperation.

The CHIS 2011-2012 screener response rate for the landline sample was 31.6 percent, and was higher for households that were sent the advance letter. For the cell phone sample, the screener response rate was 33.0 percent in all households. The extended interview response rate for the landline sample

varied across the adult (47.4 percent), child (73.2 percent) and adolescent (42.7 percent) interviews. The adolescent rate includes getting permission from a parent or guardian. The adult interview response rate for the cell sample was 53.8 percent, the child rate was 73.4 percent, and the adolescent rate 42.6 percent. Multiplying the screener and extended rates gives an overall response rate for each type of interview. The percentage of households completing one or more of the extended interviews (adult, child, and/or adolescent) is a useful summary of the overall performance of the landline sample. For CHIS 2011-2012, the landline/list sample household response rate was 17.0 percent (the product of the screener response rate and the extended interview response rate at the household level of 53.9 percent). The cell sample household response rate was 18.3 percent, incorporating a household-level extended interview response rate of 55.5 percent. All of the household and person level response rates vary by sampling stratum.

Historically, the CHIS response rates are comparable to response rates of other scientific telephone surveys in California, such as the California Behavioral Risk Factor Surveillance System (BRFSS) Survey. However, comparing the CHIS and BRFSS response rates requires recomputing the CHIS response rates so they match the BRFSS response rate calculation methods. The 2011 California BRFSS landline response rate is 37.4 percent, the cell phone response rate is 20.4 percent, and the combined landline and cell phone rate is 35.4 percent.² In contrast, the CHIS 2011-2012 landline response rate is 39.5, the cell phone response rate is 32.1 percent, and the combined landline and cell phone response rate is 35.1 percent, all these computed using the BRFSS methodology. 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. The 2011 BRFSS, for example, shows the refusal rate for California (31.4%) is the highest in the nation and twice the national median (16.0%). 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.

Further information about CHIS data quality and nonresponse bias is available at <http://healthpolicy.ucla.edu/chis/design/Pages/data-quality.aspx>.

After all follow-up attempts to complete the full questionnaire were exhausted, adults who completed at least approximately 80 percent of the questionnaire (i.e., through Section K which covers employment, income, poverty status, and food security), were counted as "complete." At least some responses in the employment and income series, or public program eligibility and food insecurity series

² As reported in the Behavioral Risk Factor Surveillance System 2011 Summary Data Quality Report (Version #5--Revised: 2/04/2013, available online at http://www.cdc.gov/brfss/pdf/2011_Summary_Data_Quality_Report.pdf.)

were missing from those cases that did not complete the entire interview. They were imputed to enhance the analytic utility of the data.

Proxy interviews were conducted 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 re-contacted and offered a proxy option. For 283 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.

1.6 Weighting the Sample

To produce population estimates from 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 procedures used for CHIS 2011-2012 accomplish 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 under-coverage 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 an iterative proportional fitting method or raking, as it is commonly called, so that the CHIS estimates are consistent with the marginal population control totals. This iterative procedure forces the CHIS weights to sum to known population control totals from an independent data source (see below). The procedure requires iteration to make sure all the control totals, or raking dimensions, are simultaneously satisfied within a pre-specified tolerance.

Population control totals of the number of persons by age, race, and sex at the stratum level for CHIS 2011-2012 were created primarily from the California Department of Finance's (DOF) 2012 Population Estimates and 2012 Population Projections. The raking procedure used 12 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 (DOF) 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 and includes, for example nursing homes, prisons, dormitories, etc.). These persons were excluded from the CHIS target population 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.

DOF control totals used to create the CHIS 2011-2012 weights are based on 2010 Census counts, while those in previous CHIS cycles were based on Census 2000 counts (with adjustments made by the Department of Finance). Please pay close attention when comparing estimates using CHIS 2011-2012 data with estimates using data from previous CHIS cycles. The most accurate California population figures are available when the US population count is conducted (every 10 years). Population-based surveys like CHIS must use estimates and projections based on the decennial population count data between Censuses. For example, population control totals for CHIS 2009 were based on DOF estimates and projections, which were based on Census 2000 counts with adjustments for demographic changes within the state between 2000 and 2009. These estimates become less accurate and more dependent on the models underlying the adjustments over time. Using the most recent Census population count information to create control totals for weighting produces the most statistically accurate population estimates for the current cycle, but it may produce unexpected increases or decreases in some survey estimates when comparing survey cycles that use 2000 Census-based information and 2010 Census-based information. See *CHIS 2011-2012 Methodology Series: Report 5 – Weighting and Variance Estimation* for more information on the weighting process.

1.7 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 those variables used in the weighting process and UCLA-CHPR 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 one of 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 who answer a survey item form a pool of donors, while the item 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, CHIS 2005, CHIS 2007, CHIS 2009, and CHIS 2011-2012 (i.e., race, ethnicity, home ownership, and education).

UCLA-CHPR imputed missing values for nearly every variable in the data files other than those imputed by Westat and some sensitive variables in which nonresponse had its own meaning. Overall, item nonresponse rates in CHIS 2011-2012 were low, with most variables missing valid responses for less than 2% of the sample. However, there were a few exceptions where item nonresponse rate was greater than 20%, such as household income.

The imputation process conducted by UCLA-CHPR 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, model-based 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 generalized linear model with a set of control variables (predictors). The link function of the model corresponds to the nature of the variable being imputed (e.g. linear regression for continuous variables, logistic regression for binary variables, etc.). Donors and recipients are grouped based on their predicted values from the model.

Control variables (predictors) used in the model to form donor pools for hot-decking 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 variable. Among the control variables, gender, age, race/ethnicity and regions were imputed by Westat. UCLA-CHPR then imputed household income and educational attainment 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 procedures were complete, every step in the data quality control process is performed once again to ensure consistency between the imputed and non-imputed values on a case-by-case basis.

1.8 Methodology Report Series

A series of five methodology reports is available with more detail about the methods used in CHIS 2011-12:

- 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 <http://www.chis.ucla.edu> or contact CHIS at CHIS@ucla.edu.

2. USE OF RESPONSE RATES

Response rates provide valuable information on the success of the survey at representing the population sampled, as suggested by Madow, Nisselson, & Olkin (1983) and many others. Nonetheless, they are not sufficient for fully assessing data quality, because the bias in an estimate is related to both the response rate and the characteristics of those responding and not responding. Keeter, Miller, Kohut, Groves, & Presser (2000), Curtin, Presser, & Singer (2000 and 2003), Groves (2006), and others have shown that the correlation between response rates and nonresponse bias is very weak. Alternative measures that are more related to nonresponse bias have been proposed (e.g., Schouten, Cobben, & Bethlehem (2009); Särndal & Lundström (2005); and Särndal (2011), but thus far none of these has become generally accepted in the survey environment (Brick J. M., 2013).

The main objectives of this report are: (1) to present response rates to analysts of CHIS 2011-2012 data; (2) to explain the methods used to calculate the response rates; and (3) to provide information about variation in the response for subgroups of the California population that might be related to nonresponse bias. To accomplish these goals, the response rates are weighted so that they estimate 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) (The American Association for Public Opinion Research, 2011). For example, weighting accounts for differences in sampling rates by county and facilitates appropriate state-level response rate reporting.

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 of the difference between the respondents and nonrespondents on the characteristic being measured. 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

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

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 & Kalsbeek, 1992). This formula shows that the bias increases as the response rate decreases, provided that the difference between respondents and nonrespondents remains constant. If the response rate is not weighted, this relationship does not hold for a survey like CHIS where selection probabilities vary across sample units. 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. 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

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

where ϕ and y are the response propensity 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. See Brick & Jones (2008) for a discussion of the effects of the response propensity on statistics other than means and for calibrated estimators. 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.

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) (Council of American Survey Research Organizations, 1982)³ and the American Association for Public Opinion Research (AAPOR) (The American Association for Public Opinion Research, 2011). The AAPOR report is periodically updated and is available on the organization’s website.⁴

We use the definitions described in the AAPOR report, which includes several different response rate definitions. Among these, RR4 and RR3 are most commonly accepted in the current survey research field. The only difference between them is that RR3 does not include partial completes while RR4 does. This report uses AAPOR’s RR4 for the telephone samples in CHIS 2011-2012 (landline, list, and cell phone samples). Since telephone numbers were sampled with different selection probabilities, we use the weighted number of telephone numbers rather than the number of cases (unweighted) to compute the response rate computation as discussed in [Chapter 2](#). This approach also compensates for the differential sampling across 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 telephone surveys. 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. These outcomes may occur for many reasons, as discussed by Shapiro et al. (1995). The eligibility of numbers with these outcomes cannot be determined directly, adding ambiguity to the definition of a response rate.

The proportion of sample units (telephone numbers or addresses) that are eligible 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 units to the total of known and estimated eligible units. One of the approaches used for estimating e was suggested in CASRO (1982). CASRO estimates e as the proportion of the resolved or observed sample units that are residential. This method is used in CHIS

³ http://c.ymcdn.com/sites/www.casro.org/resource/resmgr/docs/casro_on_definitions_of_resp.pdf

⁴ http://www.aapor.org/Standard_Definitions2.htm#UuqwvB1wqf8

2011-2012 to estimate e in the landline, surname, and cell phone samples; the estimate of e is also used in the weighting process.

The next step in computing response rates depends on the particular extended interview being analyzed, such as the adult interview. For example, to compute the conditional 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. This approach applies to all samples in CHIS 2011-2012.

In CHIS 2001 and 2003, the adult interview in the landline samples had to be completed before children or adolescents could be interviewed. Since 2005, the child-first procedure⁵ has permitted child or adolescent interviews to be done before the adult interview under certain circumstances in the landline and list samples. As a result, we have computed a household-level response rate that considers a household to be a respondent if either an adult or a child interview is completed. No child-first procedure is used in the cell phone sample. The specifics of the computations are discussed in [Chapter 5](#).

Computing a response rate for a subgroup (e.g., females) 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, for the landline and list samples, 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 virtually 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. Data for subgroup classification collected at the screener interview are used to compute subgroup response rates in CHIS 2011-2012.

An alternative approach involves computing the response rate over both the screener and the extended interview. This alternative approach is used in the Behavioral Risk Factor Surveillance System

⁵ A complete description of the child-first procedures is found in *CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods*.

(BRFSS); the specifics of the computation of the response rate are given in [Centers for Disease Control \(2013\)](#). In that report, the “overall response rate” is similar to the one used in CHIS over the years, while the one labeled “AAPOR response rate #4” is the alternative computation. The difference in the computed response rates is substantial, with the AAPOR response rate #4 having a median that is 20 percentage points higher than the overall response rate in BRFSS in 2011. When we discuss comparisons to other surveys we re-compute the CHIS 2011-2012 to give the equivalent of the BRFSS rate for comparability.

4. REVIEW OF CONTACT METHODS

CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods provides a detailed discussion of the methods used 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. [Section 4.1](#) discusses results for the landline and surname list samples. [Section 4.2](#) discusses results for the cell sample.

4.1 Landline and List Samples

CHIS includes both screening and extended interviews. For the landline and list samples, one adult was sampled from each household completing a screening interview. In households with persons under age 17, up to one child and one adolescent were also sampled. The screening interview took 2.6 minutes to conduct on average. A parent or legal guardian was interviewed about the sampled child and the sampled adolescent was interviewed if a parent or legal guardian gave permission. The adult extended interview averaged about 35 minutes in English, the child interview 15 minutes, and the adolescent interview about 23 minutes. The interviews in languages other than English generally took longer than these averages. Detailed interview timing information is given in *CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods*.

Before calling landline or list sample telephone numbers, Westat mailed a 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 2011-2012, 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 household to respond.

After the advance mailing, initial telephone calls were made to complete the screener interview with a household respondent at least 18 years old. Multiple attempts, up to at least 14 if needed, were made to establish the initial contact with the household. If the household refused to participate, additional attempts were made to complete the screener after waiting 1-3 weeks following the refusal. 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. If a landline or list sample household refused again, another telephone attempt was made at least another 2 weeks later.

A similar process was used at the extended level for sampled adults in the landline and list samples, except that no second refusals in the landline and list samples were recontacted, and there was no attempt at refusal conversion for extended interviews in the cell sample. If the adult refused, a letter was sent (if an address was available) urging him or her to participate. For child and adolescent interviews, one refusal conversion attempt was also made, but no letters were sent for either the child or adolescent interview. However, if the parent refused permission for the adolescent to be interviewed before going through the full consent process, 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 2011-2012. A very important procedure involved translating and conducting the interview in Spanish, Chinese (Cantonese and Mandarin dialects), Korean, and Vietnamese to accommodate respondents who 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, usually a spouse or child of the sampled adult, completed a proxy interview in these cases; 189 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.

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.

4.2 Cell Phone Sample

Data collection methods for the cell phone sample were similar to those for the landline and list samples with a few important differences:

- It is not possible to obtain accurate addresses for telephone numbers assigned to cellular service through publicly-accessible databases, so no prenotification letters were sent in the cell phone sample;
- Rather than a \$2 incentive in an advance letter, cell sample respondents were offered \$5 to complete the screener upon initial contact, \$25 for the adult extended interview at the time it was introduced, and \$10 for the child and adolescent interviews, in part to compensate for any charges they might be billed for air time;
- There was no conversion attempted for refusals to the adult, child or adolescent interviews.

5. RESPONSE RATE FORMULAS

This chapter describes the formulas used to compute the response rates for CHIS 2011-2012. Response rates are calculated for the **screeener** and **extended interviews**, including **household** and **person** overall response rates. Because of the different subsampling rates by stratum, unweighted response rates are not comparable to the weighted rate and should not be used to assess response patterns.

A **screeener response rate** is calculated for each sampling stratum, where the stratum is a county or group of counties in the landline sample or California region in the cell phone sample. The formula for the screeener response rate (rr_s) in a single stratum is

$$rr_s = \frac{\sum_{i \in S_{resp}} w_i}{\sum_{i \in S_{resid}} w_i}, \quad (3)$$

where w_i is the weight for household i in the stratum after adjusting for differential sampling rates, and the assignment of households with unknown residential status. For the landline sample, S_{resp} is the set of households in the stratum that responded to the screening interview and S_{resid} is the set of households in the stratum that were residential. As noted earlier, the estimated residential rates in all samples were determined using the CASRO method where the proportion of the sampled units with unknown residency status is estimated by the observed proportion of residency telephone numbers among the cases where residency status is known.

The screeener response rate for the state is computed in exactly the same way, except the sum is over the whole state rather than for the specific stratum. Thus, the state screeener response rate in each sample is a weighted average of the stratum screeener response rates where the weights are equal to the population size (i.e., count of all people) in the stratum. As a result, the state response rate differs from what would be obtained from the unweighted average of the response rates of the strata.

The screeener response rate for the cell phone sample, (rr_{s_cell}) was computed in the same way as the response rate for the landline sample using (3). The estimated residential rates in all samples were also determined using the CASRO method. The CASRO estimate is computed separately for the landline and the cell phone samples.

As mentioned in the previous chapter, because of the child-first procedure, some sampled households in the landline and surname samples completed a child or adolescent interview or both without completing an adult interview. Some household-level information normally collected as part of the adult interview was collected in child interviews in these situations. As a result, a **household-level response rate** for the extended interview can be calculated to represent the proportion of households cooperating in CHIS. The household is counted as responding if either an adult or child extended interview was completed. Those households with only an adolescent extended interview (there were only 40 such households in 2011-2012) are considered nonrespondents because household-level data were not collected in these cases. The household extended interview response rate rr_h is computed as

$$rr_h = \frac{\sum_{i \in H_{resp}} w_i^*}{\sum_{i \in H_{scr}} w_i^*}, \quad (4)$$

where w_i^* is the nonresponse adjusted weight for household i in the stratum; H_{resp} is the set of households in the stratum 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. In other words, the household response rate is conditioned on the completion of the screener interview, and thus should not be interpreted as overall survey response rate.

The next set of response rates is at the **extended interview** level. The **extended response rate** for the **adult interview** in a stratum is the weighted percentage of the adults sampled in the screener who completed the adult extended interview. The weight is the inverse of the probability of selecting the adult within the household, while for the cell phone sample it is the inverse of the probability of selecting the adult from among those who share the sampled phone number.⁶ Because of this weighting, adults sampled from landline households with more than one adult and from cell phone households where the sampled cell phone is shared have a larger effect on the response rate than those in households with only one adult. The extended adult response rate (rr_a) is computed as

⁶ If the sampled cell number is not shared, then the probability of selecting the cell owner equals 1; if the cell number is shared, we assume that every adult in the household shared the number, so the probability of selecting the cell owner is 1 / (number of adults in the household).

$$rr_a = \frac{\sum_{i \in A_{resp}} w'_i}{\sum_{i \in A_{eligsamp}} w'_i}, \quad (5)$$

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. The adult response rate is conditioned on the completion of the screener interview.

The **extended interview response rate** computation for **children and adolescents** is similar to the adult procedure; however, the child-first procedure adds some complexity in the landline/list samples. *If the adult interview was conducted before the child interview because the conditions for the child-first procedure 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 procedure was implemented, then the child response rate is conditioned only on the screener. The **extended child response rate** (rr_c) is

$$rr_c = \frac{\sum_{i \in C_{resp}} w''_i}{\sum_{i \in C_{eligsamp}} w''_i}, \quad (6)$$

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 otherwise.

The exact same procedure is used for the **adolescent extended interview response rate** (rr_t), and it is

$$rr_i = \frac{\sum_{i \in T_{resp}} w_i'''}{\sum_{i \in T_{eligsamp}} w_i'''} \quad (7)$$

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_i''' , is the inverse of the probability of selecting the adolescent within the household. Again, $rr_{i,K}$ is used to identify the rate for adolescents who were interviewed using the child-first procedure, and $rr_{i,\bar{K}}$ is for adolescents who were interviewed without using the child-first procedure.

An important source of nonresponse for the adolescent interview was the parent's refusal 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 (i.e., cases where parent permission is not obtained where it is obtained but an adolescent interview is not completed are both included in the denominator). 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

$$rr_{i-p} = \frac{\sum_{i \in T_{resp}} w_i'''}{\sum_{i \in T_{eligsamp-per}} w_i'''} \quad (8)$$

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

The extended response rates defined above are conditional rates in the sense that they are defined for households participating at the screener stage of CHIS. We next 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

$$orr_h = rr_s \cdot rr_h \quad (9)$$

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

$$orr_a = rr_s \cdot rr_a \quad (10)$$

In the landline/list samples, 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

$$orr_c = rr_s \cdot (p_{Kc} \cdot rr_{c,K} + p_{\bar{K}c} \cdot rr_{ac,\bar{K}} \cdot rr_{c,\bar{K}}) \quad (11)$$

where $rr_{ac,\bar{K}}$ is the extended adult interview response rate for adults in households with children who were sampled without the child-first procedure, and p_{Kc} and $p_{\bar{K}c}$ are the proportions of households with children in which the child-first procedure was used or not, respectively (i.e., $p_{Kc} + p_{\bar{K}c} = 1$). Notice that if the child-first procedure were not used, the overall child response rate becomes $orr_c = rr_s \cdot rr_{ac} \cdot rr_c$ as in CHIS 2001 and 2003. In contrast, in the cell phone sample, where child-first procedures were not used, the overall child response rate is similar to (10), that is, the product of the screener response rate and the child extended interview response rate.

In the landline/list samples, the **adolescent 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 the child-first procedure) is

$$orr_t = rr_s \cdot (p_{Kt} \cdot rr_{t,K} + p_{\bar{K}t} \cdot rr_{at,\bar{K}} \cdot rr_{t,\bar{K}}), \quad (12)$$

where $rr_{at,\bar{K}}$ is the extended adult interview response rate for adults in households with adolescents where the child-first procedure was not used, and p_{Kt} and $p_{\bar{K}t}$ are the proportions of households with adolescents in which the child-first procedure was used or not, respectively (i.e., $p_{Kt} + p_{\bar{K}t} = 1$). 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. As for the child response rate

for the cell phone sample, the overall cell phone adolescent response rate is computed as the product of the screener response rate and the cell phone adolescent extended interview response rate.

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.

We also computed the **overall response rates for the cell phone sample**. The expressions for the overall response rate for adults and households in the cell sample are similar to (9) and (10), respectively, use the sample screener response rate, household extended response rate, and adult response rate for the cell phone sample. Since there was no child-first procedure in the cell phone sample, the overall response rate for children in the cell phone sample is conditioned on the completion of the adult interview and is computed as

$$orr_{c_cell} = rr_{s_cell} \cdot rr_{ac_cell} \cdot rr_{c_cell}, \quad (13)$$

where rr_{s_cell} is the cell phone screener interview response rate, rr_{ac_cell} is the extended adult interview response rate for adults in households with children in the cell phone sample, and rr_{c_cell} is child extended interview response rate in the cell phone sample. The **overall adolescent response rate** in the cell phone sample is computed using a similar expression but using the extended adult interview response rate for adults in households with adolescents in the cell phone, rr_{at_cell} , and the sample and the adolescent extended interview response rate in the cell phone sample rr_{c_cell} .

We also computed the **overall response rate for the combined landline, surname and cell phone samples**. The adult response rate is the weighted average of the overall response rates of adults in the landline or list samples and adults in the cell sample. These overall rates are weighted by the adult population by type of telephone service (i.e., cell-only, both, landline-only). The overall combined response rate for the landline, surname and cell phone adult sample, orr_{a_comb} , is computed as

$$orr_{a_comb} = p_{a_cell_only} \cdot orr_{a_cell_only} + q_{a_both} \cdot orr_{a_both} + r_{a_landline_only} \cdot orr_{a_landline_only} \quad (14)$$

where $orr_{a_cell_only}$ is the overall response rate of cell-only adults sampled in the cell phone sample; orr_{a_both} is the overall response rate of adults who have a cell phone and a landline from either cell phone and landline samples; and $orr_{a_landline_only}$ is the overall response rate of landline-only adults from the landline sample. The proportions $p_{a_cell_only}$, q_{a_both} , and $r_{a_landline_only}$, ($p_{a_cell_only} + q_{a_both} + r_{a_landline_only} = 1$), are the proportions of adults by type of telephone service and were estimated using the CHIS 2011-2012 data. These proportions are 0.35, 0.56, and 0.09 respectively.

The overall cell-only adult response rates $orr_{a_cell_only}$ and $orr_{a_landline_only}$ are computed as the product of the corresponding screener response rate (i.e., cell or landline screener response rates) and the corresponding adult extended response rate (i.e., cell-only adult extended interview rates or landline-only adult extended interview response rates). In contrast, since the overall adult response rate with both telephone services, orr_{a_both} , combines samples from the cell phone and landline samples, this response rate is computed as the weighted average of the overall response rates of adults with both telephone services from the two samples as

$$orr_{a_both} = \lambda \cdot orr_{a_both}^{landline_smp} + (1 - \lambda) \cdot orr_{a_both}^{cell_smp} \quad (15)$$

where $orr_{a_both}^{landline_smp}$ and $orr_{a_both}^{cell_smp}$ are the overall response rates for adults with both types of telephone in the landline and cell phone samples respectively and λ is the composite factor used to combine these rates from the two samples. In CHIS 2011-2012 we use $\lambda = 0.75$ that is the same factor used to combine the cell phone and landline sample in weighting (see *CHIS 2011-2012 Methodology Series: Report 5 – Weighting and Variance Estimation* for additional details).

The overall response rate for children and adolescents for the combined cell phone and landline/list samples is more complex because it takes into account the child-first procedures used in the landline sample. The overall child response rate is computed using expression (14) with some differences. The proportions $p_{c_cell_only}$, q_{c_both} , and $r_{c_landline_only}$, are the proportions of children by telephone service estimated using the CHIS data. The overall response rate for children in landline-only households, $orr_{c_landline_only}$, is computed using (11) for this group. The overall response rate for children in cell-only households, $orr_{c_cell_only}$, is computed using as the product of the screener response rate, the adult extended interview in cell-only households, and the child extended interview response in cell-only households. The overall response rate for children in households with both telephone services, orr_{c_both} ,

is computed using (15) for this group. In this expression, the overall response rate in children with both telephone services in the landline sample, $orr_{c_both}^{landline_smp}$, is computed using (11) for this group because child-first procedures were used in the landline sample; while the overall response rate in children in households with both telephone services in the cell sample, $orr_{c_both}^{cell_smp}$, is computed as the product of the cell phone screener response, the adult extended interview in households with both types of telephones in the cell phone sample, and the cell phone extended interview response rate for children in households with both types of telephone. A similar expression was used to compute the combined overall response rate for adolescents.

The expression of the overall child response for the combined landline, list and cell phone samples, orr_{c_comb} , is

$$\begin{aligned}
orr_{c_comb} = & p_{c_cell_only} \cdot rr_{cell_s} \cdot rr_{ac_cell_only} \cdot rr_{c_cell_only} \\
& + q_{c_both} (\lambda \cdot rr_{landline_s} (p_{Kc} \cdot rr_{c,K} + p_{\bar{K}c} \cdot rr_{ac,\bar{K}} \cdot rr_{c,\bar{K}}) + (1-\lambda) \cdot rr_{cell_s} \cdot rr_{ac_both} \cdot rr_{c_both}) \\
& + r_{c_lanline_only} \cdot rr_{landline_s} \cdot (p_{Kc} \cdot rr_{c,K} + p_{\bar{K}c} \cdot rr_{ac,\bar{K}} \cdot rr_{c,\bar{K}})
\end{aligned} \tag{16}$$

where rr_{cell_s} is the cell phone sample screener interview response rate, $rr_{landline_s}$ is the landline sample screener interview response rate, $rr_{ac_cell_only}$ is the adult extended interview response rate in cell-only household with children, $rr_{c_cell_only}$ is the child extended interview response rate in cell-only households, rr_{ac_both} is the adult extended interview response rate in households with children with both types of telephones in the cell phone sample, rr_{c_both} is the child extended interview response rate in households with both types of telephones in the cell phone, and the other quantities have been defined before

Similarly, the expression of the overall adolescent response for the combined landline, list and cell phone samples, orr_{t_comb} , is

$$\begin{aligned}
orr_{t_comb} = & p_{t_cell_only} \cdot rr_{cell_s} \cdot rr_{at_cell_only} \cdot rr_{t_cell_only} \\
& + q_{t_both} (\lambda \cdot rr_{landline_s} (p_{Kt} \cdot rr_{t,K} + p_{\bar{K}t} \cdot rr_{at,\bar{K}} \cdot rr_{t,\bar{K}}) + (1-\lambda) \cdot rr_{cell_s} \cdot rr_{at_both} \cdot rr_{t_both}) \\
& + r_{t_lanline_only} \cdot rr_{landline_s} \cdot (p_{Kt} \cdot rr_{t,K} + p_{\bar{K}t} \cdot rr_{at,\bar{K}} \cdot rr_{t,\bar{K}})
\end{aligned} \tag{17}$$

where $rr_{at_cell_only}$ is the adult extended interview response rate in cell-only household with adolescents, $rr_{t_cell_only}$ is the adolescent extended interview response rate in cell-only households, rr_{at_both} is the adult

extended interview response rate in households with adolescents with both types of telephones in the cell phone sample, rr_{t_both} is the adolescent extended interview response rate in households with both types of telephones in the cell phone, and the other quantities have been defined before.

6. RESPONSE RATE TABLES

This chapter contains tables of response rates for the different samples in CHIS 2011-2012. The first section shows the screener response rates for the combined landline and surname list statewide and by sampling stratum, the cell phone sample, and the area sample. We also computed the screener response rate for the combined landline, surname list, and cell phone samples. The second section presents the response rates for the screener interview, adult, child, and adolescent interviews for all samples. This section also presents the household response rates and response rates by respondent characteristics across all samples. Finally, the last section presents the overall response rates for each extended interview type. All of the rates are weighted and use the formulas presented in the previous chapter.

6.1 Screener Response Rates

The **screener response rates** for the **combined landline and surname list sample**, by 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, 64,835 households from these samples completed the CHIS 2011-2012 screener interview. In each of these households, one adult was sampled.

As Figure 6-1 shows, the overall screener response rate for the state, including the sample drawn from the surname lists, is 31.6 percent, 4.5 percentage points lower than in 2009. As discussed in [Chapter 3](#), this response rate was computed using the CASRO method to allocate the numbers whose eligibility cannot be determined (those for which every call was not answered or only answered by an answering machine). Surveys vary in how they account for undetermined residential number status, and the method used can lead to very different estimates of response rates. One approach 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 2011-2012 gives a weighted overall state-level cooperation rate of 45.4 percent for the landline/surname sample. This rate assumes that none of the undetermined cases were eligible households and produces the most liberal (i.e., highest) response rates. This assumption is not reasonable in most sample surveys, which is why CHIS uses the CASRO method for undetermined eligibility cases.

Table 6-1. Number of completed screeners and screener response rates by sampling stratum and whether an advance letter was sent for the landline/list sample

Stratum	Total		Advance letter mailed			
			Yes		No	
	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
State total	64,835	31.6	48,762	36.9	16,073	22.2
1 Los Angeles	14,748	29.2	10,650	34.3	4,098	21.3
2 San Diego	8,099	31.3	5,697	37.1	2,402	23.1
3 Orange	3,850	28.7	2,851	34.7	999	19.7
4 Santa Clara	2,221	29.4	1,795	34.5	426	18.7
5 San Bernardino	2,110	33.0	1,463	37.9	647	25.5
6 Riverside	2,635	33.1	1,794	38.4	841	25.5
7 Alameda	1,817	29.4	1,480	34.1	337	18.5
8 Sacramento	1,789	32.4	1,296	37.7	493	23.4
9 Contra Costa	1,157	30.2	947	34.7	210	19.2
10 Fresno	825	32.6	635	38.3	190	21.6
11 San Francisco	1,136	25.2	892	29.4	244	16.9
12 Ventura	877	34.6	655	40.3	222	24.3
13 San Mateo	942	28.1	752	31.3	190	20.0
14 Kern	907	37.6	701	43.9	206	25.2
15 San Joaquin	718	34.3	564	38.5	154	24.5
16 Sonoma	611	34.7	506	39.3	105	21.5
17 Stanislaus	792	34.4	626	39.0	166	24.1
18 Santa Barbara	768	36.4	574	43.6	194	24.6
19 Solano	755	30.2	618	35.3	137	18.5
20 Tulare	778	41.2	614	47.6	164	27.3
21 Santa Cruz	710	36.3	576	41.3	134	24.0
22 Marin	715	29.6	595	33.3	120	19.2
23 San Luis Obispo	658	38.0	545	43.5	113	23.7
24 Placer	728	35.5	519	40.8	209	26.9
25 Merced	823	33.4	621	39.8	202	22.4
26 Butte	637	40.0	533	47.3	104	21.7
27 Shasta	706	41.4	529	49.1	177	28.0
28 Yolo	621	36.0	485	42.2	136	23.4
29 El Dorado	630	37.2	513	43.1	117	23.3
30 Imperial	956	41.9	795	48.7	161	24.4
31 Napa	824	32.6	702	36.7	122	20.2
32 Kings	853	35.7	714	41.2	139	21.3
33 Madera	845	41.3	598	47.6	247	31.0
34 Monterey	548	35.0	445	40.7	103	22.1
35 Humboldt	511	44.1	406	49.3	105	30.4
36 Nevada	724	39.2	570	45.1	154	26.1
37 Mendocino	754	42.8	597	48.2	157	29.5
38 Sutter	784	38.4	637	41.5	147	29.0

Table 6-1. Number of completed screeners and screener response rates by sampling stratum and whether an advance letter was sent for the landline/list sample (continued)

Stratum	Total		Advance letter mailed			
	Complete	Response rate (%)	Yes		No	
			Complete	Response rate (%)	Complete	Response rate (%)
39 Yuba	952	35.9	739	41.0	213	25.2
40 Lake	755	38.1	582	44.0	173	26.1
41 San Benito	917	34.0	740	39.3	177	21.8
42 Colusa, Glenn, Tehama	613	43.8	475	49.7	138	31.2
43 Del Norte, Siskiyou, Lassen, Trinity, Modoc, Plumas, Sierra	456	48.5	327	53.6	129	38.9
44 Amador, Alpine, Calaveras, Inyo, Mariposa, Mono, Tuolumne	580	36.4	409	39.5	171	30.6

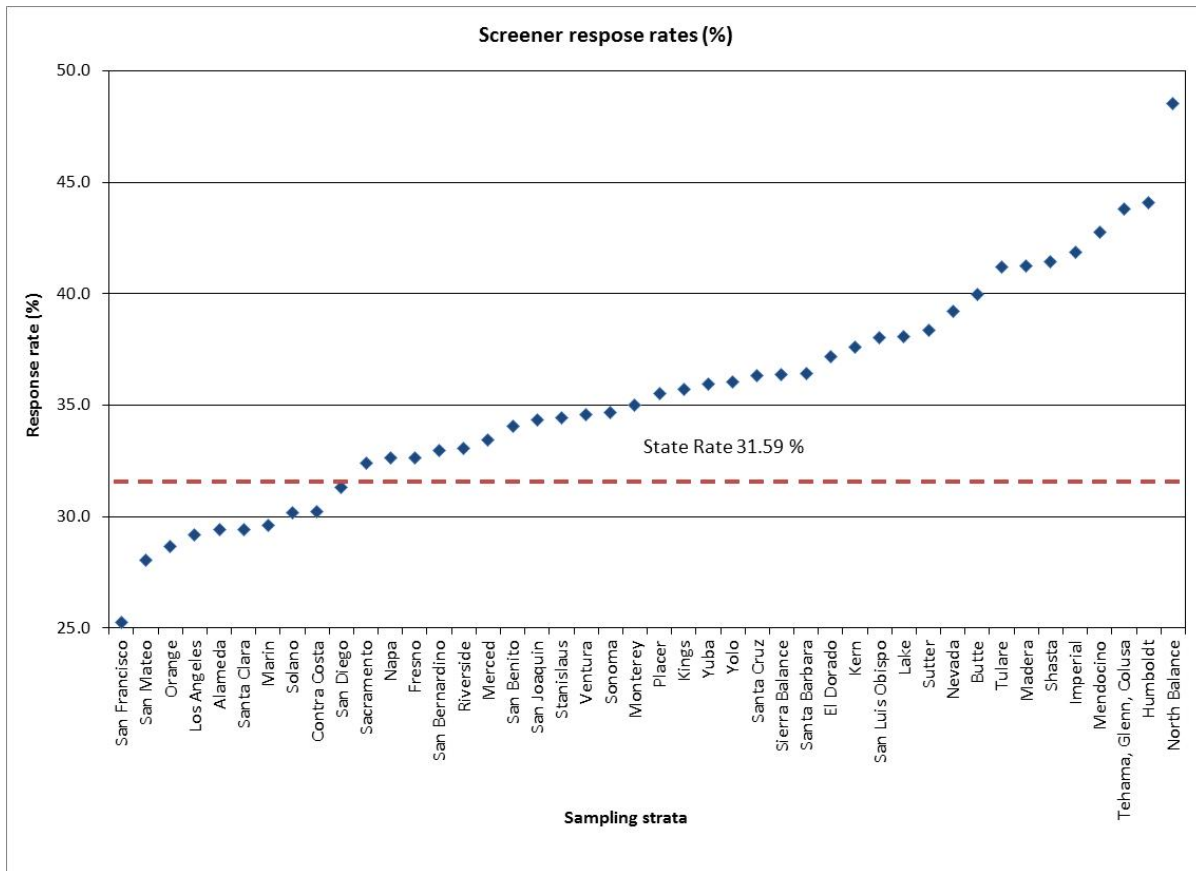
Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

The table shows that the screener response rates for the landline/list samples vary by county, which is also illustrated in Figure 6-1. The median response across all counties is 35.0 percent, and the highest response rate is 48.5 percent in the stratum that includes Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, and Trinity Counties. San Francisco has the lowest response rate at 25.2 percent, which is at the low end of the scale in Figure 6-1. The next lowest response rate (San Mateo) is about 2.8 points higher than the San Francisco rate. The screener response rate in Los Angeles is 3.9 points higher than the San Francisco rate and 2.5 points lower than the state response rate. The county rankings shown in Figure 6-1 are similar to those in previous CHIS cycles.

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 31.3 percent. This is 5.1 points lower than the 36.4 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.

Table 6-1 also tabulates the response rates by whether an advance letter could be mailed to the household. We discuss these rates later.

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



Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Table 6-2. shows the **screener response rates** for households from the **cell phone sample**. Overall, 16,340 screener interviews were completed statewide and the state screener response rate was 33.0 percent. The screener response rate in CHIS 2009 was 19.0 percent, so the response rate increased by 13.7 percentage points in 2011-2012. For some discussion of how this increase came about see *CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods*, which presents a comparison of final cell sample screener dispositions between CHIS 2009 and CHIS 2011-2012.

Response rates based on region are also provided, and range from a low of 30.2 percent in the Greater Bay Area to a high of 38.2 percent in the San Joaquin Valley. When looking at the regional rates for the cell phone sample, it should be noted that these are based on the region of telephone number assignment, not self-reported residence (which is not available for nonrespondents).

Table 6-2. Number of completed screener interviews and screener response rates by region for the cell-only component of the cell phone sample

Region	Screener interview	
	Complete	Response rate (%)
State total	16,340	33.0
1 - Northern & Sierra Counties	1,044	35.9
2 - Greater Bay Area	3,097	30.2
3 - Sacramento Area	1,495	31.9
4 - San Joaquin Valley	1,668	38.2
5 - Central Coast	1,248	35.5
6 - Los Angeles	3,665	32.6
7 - Other Southern California	4,123	33.4

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

6.2 Person and Household Response Rates

The household, adult, child, and adolescent extended interview response rates for each stratum of the landline and surname list samples are given in Table 6-3, along with the number of completed interviews. There were 35,368 households where either an adult or child extended interview (or both) was completed, resulting in a statewide household level response rate of 53.9 percent for these samples. Additionally, 33,784 adult interviews, 5,811 interviews about children, and 2,242 adolescent interviews were completed in the landline and list samples.

The statewide adult response rate for the landline/list sample shown in Table 6-3 for the adult interview was 47.4 percent, a decrease of 1.7 points from CHIS 2009. As with the screener, 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 48.2 percent, while for counties with less than 500,000 the median adult response rate is 52.3 percent. This difference may be attributable to a variety of reasons, including the different distribution of persons by age, education, etc., by county. The 2011-2012 child interview response rate was 73.2 percent, which is almost identical to the 73.1 percent observed in CHIS 2009. The adolescent interview rate showed the same stability, with 42.7 percent compared with 42.8 percent in CHIS 2009.

Table 6-3. Number of completed extended interviews and response rates by sampling stratum and type of interview for the landline/list sample (conditional on completed screener)

Stratum	Household		Adult		Child		Adolescent	
	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
State total	35,368	53.9	33,784	47.4	5,811	73.2	2,242	42.7
1 Los Angeles	7,411	49.6	7,050	42.8	1,228	69.7	475	41.0
2 San Diego	4,357	53.4	4,142	47.0	756	74.9	272	49.0
3 Orange	1,994	51.5	1,905	46.0	333	75.2	124	37.5
4 Santa Clara	1,226	56.0	1,153	48.5	246	71.6	76	34.4
5 San Bernardino	1,114	52.3	1,052	46.2	193	75.0	92	47.9
6 Riverside	1,400	52.2	1,339	45.2	230	70.5	86	42.2
7 Alameda	1,082	58.6	1,037	52.7	177	79.7	70	46.8
8 Sacramento	1,022	56.5	985	49.8	171	74.9	53	45.1
9 Contra Costa	683	59.0	651	52.6	99	65.2	29	33.2
10 Fresno	465	56.3	440	50.4	103	79.2	43	54.2
11 San Francisco	630	56.1	613	49.2	75	75.1	18	34.4
12 Ventura	483	55.3	461	49.4	88	74.3	32	33.8
13 San Mateo	526	55.4	501	48.2	69	61.4	26	30.5
14 Kern	502	54.5	473	47.2	100	83.0	42	49.0
15 San Joaquin	371	51.5	355	46.7	66	69.7	28	44.7
16 Sonoma	371	61.5	354	53.6	60	70.9	34	66.5
17 Stanislaus	423	53.0	405	46.8	77	71.3	33	41.8
18 Santa Barbara	440	56.8	416	48.1	66	81.8	31	63.8
19 Solano	413	54.6	398	49.1	53	69.8	24	37.8
20 Tulare	397	50.8	375	44.0	76	75.4	28	39.1
21 Santa Cruz	415	58.1	401	51.9	68	74.9	30	47.9
22 Marin	450	62.0	438	57.7	58	77.9	23	38.2
23 San Luis Obispo	420	63.5	407	58.0	53	84.1	23	60.0
24 Placer	398	53.8	384	47.9	46	71.2	21	38.2
25 Merced	447	54.3	418	47.3	91	76.8	36	44.4
26 Butte	383	60.0	370	57.0	49	76.5	21	49.0
27 Shasta	418	58.0	406	53.4	52	94.6	18	39.6
28 Yolo	382	61.4	368	55.3	67	81.2	24	42.8
29 El Dorado	387	61.2	375	56.4	59	83.3	21	41.3
30 Imperial	481	50.2	460	46.3	98	74.5	47	46.2
31 Napa	478	57.6	457	50.7	58	77.0	24	49.1
32 Kings	471	55.5	443	49.2	108	78.9	47	62.6
33 Madera	488	57.7	466	52.5	88	71.7	35	36.0
34 Monterey	310	57.0	297	49.9	60	69.7	22	44.1
35 Humboldt	331	63.7	322	57.9	52	82.1	25	58.7
36 Nevada	454	62.5	440	57.3	64	81.2	26	52.4
37 Mendocino	445	60.2	433	57.1	52	73.5	19	45.7
38 Sutter	436	55.7	416	49.5	65	83.1	25	41.8
39 Yuba	501	53.0	480	47.0	103	87.1	30	45.3
40 Lake	467	60.2	460	55.0	34	72.1	22	52.2
41 San Benito	488	52.1	464	46.0	95	74.8	41	44.5
42 Colusa, Glenn, Tehama	351	56.5	333	52.5	61	81.3	25	49.7

Table 6-3. Number of completed extended interviews and response rates by sampling stratum and type of interview for the landline/list sample (continued)

Stratum	Household		Adult		Child		Adolescent	
	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
43 Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, Trinity	303	66.5	296	62.1	29	82.0	8	20.1
44 Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, Tuolumne	354	61.1	345	56.6	35	84.0	13	18.3

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Table 6-4 shows the household, adult, child, and adolescent extended interview response rate for the cell phone sample. There were 9,151 households where either an adult or child extended interview (or both) was completed, resulting in a statewide household level response rate of 55.5 percent. Within region, there was a wide range of rates, with a low of 53.7 percent in Los Angeles to a high of 64.7 percent in the Northern and Sierra Counties region.

Additionally, 9,151 adult interviews, 1,523 interviews about children, and 557 adolescent interviews were completed in the cell phone sample. The statewide response rate for the adult interview was 53.8 percent. This represents a decrease of 2.4 percentage points from CHIS 2009.

Table 6-4. Number of completed extended interviews and extended interview response rate by region for the cell phone sample

Region	Household		Adult		Child		Adolescent	
	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
State total	9,151	55.5	9,151	53.8	1,523	73.4	557	42.6
1 - Northern & Sierra Counties	667	64.7	667	63.5	100	83.1	41	56.0
2 - Greater Bay Area	1,744	56.2	1,744	54.9	279	78.9	90	43.6
3 - Sacramento Area	893	60.5	893	60.8	138	68.0	62	66.0
4 - San Joaquin Valley	904	54.8	904	51.6	193	73.2	71	38.2
5 - Central Coast	684	54.4	684	51.8	107	70.9	35	45.0
6 - Los Angeles	1,970	53.7	1,970	51.5	320	70.4	121	43.7
7 - Other Southern California	2,289	55.4	2,289	54.2	386	73.5	137	38.1

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

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 6-5

shows the adult response rates by these screener data items.⁷ Results are shown separately for the combined landline and surname list samples and the cell sample. Overall, the cell response rate is higher than that for the landline/list samples, despite the fact that no refusal conversion is attempted for cell sample adult interviews. One explanation for this difference is evident in the final two rows of Table 6-5: the landline/list response rate is about 7 points higher than the cell rate if the screener respondent is sampled, and about 13 points higher if another adult is sampled. For the cell sample, within-household sampling of adults is done only if the sampled number is shared by two or more adults. The screener respondent was the sampled adult in 58 percent of landline/list households, compared with 96 percent of cell households. Since the response rate was dramatically lower when an adult other than the screener respondent was selected for both samples, the higher proportion of screener respondents selected as the sampled adult translates to a higher overall response rate for the cell sample.

Table 6-5. Adult response rates by characteristics of the sampled adult

Characteristic	Sample type response rate (%)	
	Landline/List	Cell phone
Total	47.4	53.8
Sex		
Male	41.9	52.4
Female	52.3	55.3
Age		
18 to 30 years	34.9	52.4
31 to 45 years	41.6	51.5
46 to 65 years	49.1	56.5
Over 65 years	58.4	55.2
Type of household		
With somebody less than 18 years old	42.2	50.3
Without somebody less than 18 years old	50.8	56.7
Number of adults in household		
1	67.1	54.3
2	50.3	56.5
3 or more	38.6	50.4
Adult was screener respondent		
Yes	64.4	57.5
No	31.6	18.5

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Another notable difference in the response rate pattern between the landline/list and cell samples is by sampled adult gender. Women are traditionally more cooperative than men in landline and list samples, and this pattern is borne out in CHIS 2011-2012. In contrast, this gender response gap is much

⁷ 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.

smaller in the cell sample. Men also respond at a higher rate (52 percent) in the cell sample than in the landline/list sample (42 percent).

Older adults are also typically more cooperative than younger adults, and again this pattern is borne out in the landline/list sample, with almost a 23.5 point difference between the rates for those 18-30 and those over 65. In the cell sample, which includes respondents with both cell phones and landlines and with only cell phone service, the difference between these groups is 2.8 percentage points. In the landline/list sample, those 18-30 comprise 11 percent of sampled adults, as compared with 29 percent for the cell sample.

Across CHIS cycles, response among households with children is declining faster than among those without (see *CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods*). In the landline and list samples, there is an 8.7 point difference in response rate between adults in households with children and those in other households. This difference is 2.8 points in the cell phone sample. Thirty-three percent of landline/list households with a sampled adult included a child under 18, as compared with 43 percent of cell households.

In the landline/list sample, adult response rates decline substantially as more adults are present in the household. A major reason for this is that, as noted earlier, response rates are lower (and declining more rapidly) for sampled adults who are not the screener respondent (shown in the last rows of Table 6-5). The more adults in the household, the more likely the sampled adult is not the screener respondent. If the sampled adult is not home, a call-back is required, essentially creating a second contact attempt. In contrast, this response rate pattern does not hold in the cell sample, where sampling among adults is only needed when the cell phone is shared, which is a rare occurrence. Further in the landline/list sample, 76 percent of sampled adults were from multi-adult households, as compared with 81 percent in the cell sample.

These differences in response rates, and in the proportions of adults sampled, by respondent characteristics across samples have implications for the utility of the cell phone sample. In addition to reducing the potential bias by including persons without a landline, the cell sample increases the representation of men, young adults, those in households with children, and those in multi-adult households compared with the landline sample alone.

Now, we examine the **child extended interview response rates**. Table 6-6 shows that the statewide child-level response rate is 72.5 percent for the landline and surname samples, which is relatively high and slightly higher than in CHIS 2009. The median rate in the more populous counties

(74.9 %) is 2.1 points lower than the rate in smaller counties (77.0%). The statewide child-level response for the cell phone sample is 73.4 percent, which is almost the same as the response rate in the combined landline and surname samples, and 2.6 points lower than the rate for the child cell phone sample in CHIS 2009.

Table 6-6 shows the child response rates by the characteristics of the child and household using data collected in the screener or adult interview where the children were enumerated for sampling. The child rates do not show much variation by sex or age of the child or the number of children in the household in the landline and surname samples. In contrast, in the cell phone sample there are differences by age group. *CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods* contains more detail on response to the child interview.

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

Characteristic	Sample type response rate (%)	
	Landline/List	Cell phone
Total	72.5	73.4
Sex		
Male	72.9	73.5
Female	73.8	73.3
Age		
Less than 4 years	72.8	77.3
4 to 7 years	74.2	71.4
8 to 11 years	72.5	71.9
Number of children in household		
1	72.9	76.4
2	73.8	71.6
3	70.5	68.2
4 or more	77.9	82.9

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

The last person-level response rates presented are for the **adolescent interview**. Recall 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 legal guardian, and then contact and interview the adolescent. Consequently, response rates for the adolescent interview are lower than for the child interview, because the latter required only one person to agree. Table 6-7 shows that the state-level adolescent response rate is 42.8 percent. If we exclude the nonresponse due to parents not giving permission to interview the adolescent, the cooperation rate rises 32.3 percentage points to 75.1 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

42.7 percent and the counties with fewer than 500,000 persons have a median response rate of 47.0 percent. Table 6-7 gives the adolescent response rates by the characteristics of the adolescent and household based on data collected in the adult interview or screener. These rates, like the corresponding child rates, have little variation across sex, age, and the number of adolescents in the household. There is also little difference between the landline/list and cell samples.

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 (i.e., response rate conditional on parent permission). This rate is indicative of the ability to contact and interview the adolescents. These rates are given in Table 6-8, which is similar to Table 6-7 but excludes the sampled adolescents without parental permission from the denominator of the response rate computation, so the rates are much higher. The overall adolescent cooperation rate is about 4 points lower for the cell sample than for the landline/list sample; one interpretation is that parents in the cell sample were more likely to give permission than those in the landline/list sample. In both samples there are differences in adolescent cooperation by age and gender, with younger children and girls more likely to agree to the interview than older children and boys. These differences are somewhat larger in the cell sample than in the landline/list sample.

Table 6-7. Adolescent response rates conditional on parent permission by characteristics of the sampled adolescent

Characteristic	Sample type response rate (%)	
	Landline/List	Cell phone
Total	42.7	42.6
Sex		
Male	41.9	41.1
Female	44.7	44.4
Age		
12 to 14 years	41.2	44.0
15 to 17 years	44.2	41.3
Number of adolescents in household		
1	41.9	41.4
2	44.7	44.5
3 or more	38.5	41.7

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Table 6-8. Adolescent cooperation rates excluding parental permission nonresponse by characteristics of the sampled adolescent

Characteristic	Sample type response rate (%)	
	Landline/List	Cell phone
Total	74.0	69.9
Sex		
Male	72.4	66.9
Female	75.0	73.3
Age		
12 to 14 years	76.0	76.2
15 to 17 years	72.2	64.6
Number of adolescents in household		
1	72.8	68.1
2	76.0	72.7
3 or more	69.3	67.4

Source: UCLA Center for Health Policy Research, 2011-2012 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 Table 6-1 through were taken into account in the development of the weights as described in *CHIS 2011-2012 Methodology Series: Report 5 – Weighting and Variance Estimation*. For example, nonresponse adjustments were done separately by county, thus accounting for the differences in response rates 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 for the different samples in CHIS 2011-2012. Table 6-9 gives these response rates for the entire state and by county for the combined landline/list sample. 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 6-3). 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 equations (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 2.7 percentage points lower than it was in CHIS 2009.

Table 6-9. Overall response rates by sampling stratum and type of interview for the landline/list sample*

	Stratum	Interview type overall response rate(%)			
		Household	Adult	Child	Adolescent
	State total	17.0	15.0	13.8	6.7
1	Los Angeles	14.5	12.5	11.2	5.5
2	San Diego	16.7	14.7	14.5	7.7
3	Orange	14.8	13.2	12.4	4.7
4	Santa Clara	16.5	14.3	13.8	5.5
5	San Bernardino	17.2	15.2	14.3	7.9
6	Riverside	17.2	15.0	13.1	6.7
7	Alameda	17.2	15.5	14.8	7.6
8	Sacramento	18.3	16.1	14.9	7.5
9	Contra Costa	17.8	15.9	14.3	5.6
10	Fresno	18.4	16.5	17.7	10.6
11	San Francisco	14.2	12.4	12.4	3.8
12	Ventura	19.1	17.1	16.1	6.6
13	San Mateo	15.6	13.5	10.4	4.5
14	Kern	20.5	17.7	18.1	8.9
15	San Joaquin	17.7	16.0	13.8	7.5
16	Sonoma	21.3	18.6	16.0	11.2
17	Stanislaus	18.3	16.1	15.5	7.2
18	Santa Barbara	20.7	17.5	17.6	11.8
19	Solano	16.5	14.8	12.8	5.0
20	Tulare	20.9	18.1	16.6	8.2
21	Santa Cruz	21.1	18.8	16.6	9.2
22	Marin	18.4	17.1	16.0	6.8
23	San Luis Obispo	24.1	22.1	21.5	12.0
24	Placer	19.1	17.0	15.6	6.9
25	Merced	18.1	15.8	13.5	7.0
26	Butte	24.0	22.8	19.8	13.4
27	Shasta	24.0	22.1	22.0	7.8
28	Yolo	22.1	19.9	17.5	8.4
29	El Dorado	22.7	21.0	22.4	10.1
30	Imperial	21.0	19.4	18.4	10.3
31	Napa	18.8	16.6	15.8	7.3
32	Kings	19.8	17.6	16.8	12.2
33	Madera	23.8	21.7	17.9	7.7
34	Monterey	20.0	17.5	14.0	7.9
35	Humboldt	28.1	25.5	21.6	15.4
36	Nevada	24.5	22.5	20.8	13.9
37	Mendocino	25.7	24.4	20.1	11.9
38	Sutter	21.4	19.0	18.6	8.9
39	Yuba	19.0	16.9	16.6	7.9

Table 6-9. Overall response rates by sampling stratum and type of interview for the landline/list sample* (continued)

Stratum	Interview type overall response rate(%)			
	Household	Adult	Child	Adolescent
40 Lake	22.9	21.0	18.1	10.2
41 San Benito	17.7	15.7	15.7	8.1
42 Colusa, Glenn, Tehama	24.7	23.0	25.3	11.7
43 Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, Trinity	32.3	30.1	28.0	9.8
44 Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, Tuolumne	22.2	20.6	21.3	6.7

* Overall response rate is calculated by multiplying the screener interview response rate by the extended interview response rate (where the extended response rate is conditional on a completed screener).

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Table 6-10 shows the overall response rate for the cell phone sample. The lowest adult response rate was in Los Angeles (16.8%) while the highest was in the Northern and Sierra Counties (22.8%). The overall adult response rate was 17.8 percent, which is 2.8 percentage points higher than the overall 15.0 percent rate that was observed for adults in the landline/list sample.

Table 6-10. Overall response rates for the cell phone sample by region and type of interview

Region	Overall response rate (%)			
	Household	Adult	Child	Adolescent
State total	18.3	17.8	13.0	7.6
1 - Northern & Sierra Counties	23.2	22.8	18.9	12.7
2 - Greater Bay Area	17.0	16.6	13.1	7.2
3 - Sacramento Area	19.3	19.4	13.2	12.8
4 - San Joaquin Valley	21.0	19.7	14.5	7.5
5 - Central Coast	19.3	18.4	13.0	8.3
6 - Los Angeles	17.5	16.8	11.8	7.3
7 - Other Southern California	18.5	18.1	13.3	6.9

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Table 6-11 summarizes the overall response rates by sample types. The cell phone sample has a higher overall response rate than landline and surname samples except for the child interview.

Table 6-11. Overall response rates by sample type and type of interview

Sample type	Overall response rate (%)			
	Household	Adult	Child	Adolescent
Landline/list	17.0	15.0	13.8	6.7
Cell phone	18.3	17.8	13.0	7.6
Landline/list//cell-phone	17.7	16.3	13.4	7.0

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

7. DISCUSSION OF RESPONSE RATES

In this chapter, we discuss the response rates from CHIS 2011-2012 in the context of procedures used to increase response rates and how these rates compare to those from other telephone surveys. The first section briefly reviews some of the methods used in CHIS 2011-2012 that effect response rates, mentioned in [Chapter 4](#). A more complete discussion of these methods is provided in *CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods*. The response rates obtained in CHIS 2011-2012 are then compared to rates from other surveys. Earlier reports, the *CHIS 2001 Methodology Series: Report 4 – Response Rates* (California Health Interview Survey, 2002), *CHIS 2003 Methodology Series: Report 4 – Response Rates* (California Health Interview Survey, 2005), *CHIS 2005 Methodology Series: Report 4 – Response Rates* (California Health Interview Survey, 2007), *CHIS 2007 Methodology Series: Report 4 – Response Rates* (California Health Interview Survey, 2009), and *CHIS 2009 Methodology Series: Report 4 – Response Rates* (California Health Interview Survey, 2011) contain many comparisons to other surveys, so this review is limited to new telephone 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 four 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 2011-2012 Methodology Series: Report 2 – Data Collection Methods*. We summarize them here to provide some context for the CHIS 2011-2012 response rates.

One issue that has been the topic of considerable discussion in the telephone survey literature is the method of selecting adults within a household. Beginning in 2003, CHIS has used the method proposed by Rizzo, Brick, & Park, (2004) that bypasses 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 2011-2012 Methodology Series: Report 1 – Sample Design*.

The child-first procedure was implemented beginning with CHIS 2005 with the express intent of increasing the yield and response rates for the child interviews. This procedure increased both the yield and response rates for the child interviews in the landline and list samples. 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. The child-first procedure is not used in the cell phone sample.

As in previous cycles of CHIS, a variety of interviewer training methods have implanted 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 was an advance mailing sent to all landline and list 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 2011-2012, 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

Type	Response rate (%)			Difference (%)
	Advance letter mailed			
	Yes	No		
Screener	36.9	22.2	+14.7	
Adult interview	49.7	43.1	+6.7	
Child interview	73.2	65.4	+7.7	
Adolescent interview	42.7	31.0	+11.7	
Household extended	56.2	49.8	+6.4	

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Other methods for enhancing response rates in CHIS 2011-2012 include:

- **Repeated Call Attempts:** The procedures implemented in CHIS 2011-2012 allowed many attempts to reduce the bias from this source of nonresponse. Most interviews were completed within a few call attempts, where the median number of call attempts for a completed screener is three and for an adult interview is two. However, each distribution has a long tail (the 75th percentile of the number of completed screeners is the sixth attempt).
- **Recontacting initial refusals:** The refusal conversion protocol is described in [Chapter 4](#).
- **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 2011-2012. A total of 189 adult proxy interviews were done in the landline 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 since the first cycle of CHIS 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. Close to 14,500 households completed the screener using a language other than English, accounting for about 18 percent of all the completed screener interviews in CHIS 2011-2012. Spanish is the most frequently used language, with 79 percent of the non-English screeners being completed in Spanish. Vietnamese was the second most frequently used language in the interviews. Lee, Nguyen, Jawad, & Kurata, (2008) describe the effects on the bias associated with this effort for previous cycles of CHIS.

7.2 Comparisons of Response Rates Over the Cycles

While the sampling and content varies somewhat across the cycles of CHIS, the survey procedures are very similar. One adult is sampled from each household and asked to complete an 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 2011-2012 are similar to the ones used in previous cycles, although the child-first procedures have some implications for the response rates beginning in 2005, as noted earlier.

Table 7-3 summarizes the screener interview, extended interview, overall, and combined response rates by cycle for the CHIS samples. The state-level response rates for the landline/list sample have been declining steadily since the first cycle of CHIS in 2001. The screener response rate decreased 4.5 points between 2009 and 2011-2012 in the landline/list sample, but showed a dramatic increase (13.7 points) in the cell sample. The mean decline in screener response for the landline/list sample from cycle to cycle has been about 11 percent, with the largest decrease (28 percent) occurring between 2005 and 2007, which was followed by an increase between 2007 and 2009. The mean decline in the conditional adult response rate has been about 5.6 percent, with the largest decrease (almost 10 percent) between 2005 and 2007. For more detail on the increase in the cell sample screener response rate, see *CHIS 2011-2012 Methodology Series: Report 2 – Data Collection Methods*.

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

Interview type/ Sample type	Non-English						Total	Total
	English	Spanish	Vietnamese	Korean	Cantonese	Mandarin		
Screeners interviews								
Total	66,701	11,428	1,205	997	421	423	14,474	81,175
Landline	51,691	9,261	400	391	377	371	10,800	62,491
Cell phone sample	13,956	2,165	61	69	42	47	2,384	16,340
Korean only**	125	2	1	408	0	1	412	537
Korean and other**	50	0	8	129	1	0	138	188
Vietnamese only**	291	0	735	0	1	4	740	1,031
American Indian or Alaska Native	588	0	0	0	0	0	0	588
Adult interviews								
Total	36,895	4,406	663	528	207	236	6,040	42,935
Landline	28,320	3,516	252	207	187	210	4,372	32,692
Cell phone sample	8,148	890	27	41	19	26	1,003	9,151
Korean only**	53	0	0	214	0	0	214	267
Korean and other**	16	0	4	66	0	0	70	86
Vietnamese only**	91	0	380	0	1	0	381	472
American Indian or Alaska Native	267	0	0	0	0	0	0	267
Child interviews								
Total	5,354	1,764	130	48	12	26	1,980	7,334
Landline	4,002	1,504	45	16	8	25	1,598	5,600
Cell phone sample	1,254	259	3	3	3	1	269	1,523
Korean only**	17	1	0	18	0	0	19	36
Korean and other**	4	0	2	11	0	0	13	17
Vietnamese only**	27	0	80	0	1	0	81	108
American Indian or Alaska Native	50	0	0	0	0	0	0	50
Parent Permission interviews								
Total	2,691	1,119	59	40	9	13	1,240	3,931
Cell phone sample	1,993	952	18	10	7	13	1,000	2,993
Landline	638	167	2	3	2	0	174	812
Korean only**	7	0	0	18	0	0	18	25
Korean and other**	2	0	1	9	0	0	10	12
Vietnamese only**	17	0	38	0	0	0	38	55
American Indian or Alaska Native	34	0	0	0	0	0	0	34
Adolescent interviews								
Total	2,597	183	8	5	2	4	202	2,799
Landline	1,997	159	1	2	1	4	167	2,164
Cell phone sample	532	24	0	0	1	0	25	557
Korean only**	14	0	0	2	0	0	2	16
Korean and other**	4	0	0	1	0	0	1	5
Vietnamese only**	29	0	7	0	0	0	7	36
American Indian or Alaska Native	21	0	0	0	0	0	0	21

* In 2011-12 there were 6 types of samples 1) Landline, 2) Cell phone, 3) Korean surname list, 4) Korean and other list, 5) Vietnamese list, and 6) American Indian/Alaska Native list. See *CHIS 2011-2012 Methodology Series: Report 1: Sample Design* at <http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx> for details.

** Korean only refers to supplemental samples from a frame with Korean only and not other ethnic group surnames. Similarly, Vietnamese only refers to the supplemental samples from a frame with Vietnamese only and not other ethnic group surnames. Korean and other refers to the supplemental sample from a frame with surnames likely to be either Korean or some other ethnic group.

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

Table 7-3. Comparison of state-level response rates for the landline/list sample from CHIS 2001 to 2011-2012

Type	CHIS cycle response rate (%)					
	2001	2003	2005	2007	2009	2011-2012
Landline/list sample						
Screener Interview	59.2	55.9	49.8	35.6	36.1	31.6
Extended Interview						
Household ¹	-	-	59.3	59.4	54.7	53.9
Adult	63.7	59.9	54.0	52.8	49.0	47.4
Child	87.6	81.4	75.2	73.7	72.9	73.2
Adolescent	63.5	57.3	48.5	44.1	42.8	42.7
Adolescent w/ parental permission ²	84.5	83.3	77.5	74.7	75.1	74.0
Overall landline/list ³						
Household	-	-	29.6	21.1	19.7	17.0
Adult	37.7	33.5	26.9	18.7	17.7	15.0
Child	33.0	27.3	25.2	16.8	15.7	13.8
Adolescent	23.9	19.2	14.2	10.2	7.9	6.7
Cell phone sample⁴						
Screener Interview	-	-	-	-	19.3	33.0
Extended Interview	-	-	-	-		
Household ¹	-	-	-	-	57.6	55.5
Adult	-	-	-	-	56.2	53.8
Child	-	-	-	-	76.0	73.4
Adolescent	-	-	-	-	46.4	42.6
Adolescent w/ parental permission ²	-	-	-	-	75.6	69.9
Overall cell phone	-	-	-	-		
Household	-	-	-	-	11.1	18.3
Adult	-	-	-	-	10.8	17.8
Child	-	-	-	-	8.2	13.0
Adolescent	-	-	-	-	5.0	7.6
Combined landline/list and cell phone sample⁴						
Household	-	-	-	-	17.4	17.7
Adult	-	-	-	-	15.6	16.3
Child	-	-	-	-	14.1	13.4
Adolescent	-	-	-	-	7.5	7.0

¹ Household rate available since 2005.

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.

⁴ Cell phone sample used 2009 forward.

Source: UCLA Center for Health Policy Research, 2011-2012 California Health Interview Survey.

The extended interview response rates for the landline/list sample changed very little between the 2009 and 2011-2012 cycles, so the decline in overall response rates for this sample is almost entirely due to the screener. [Appendix A](#) provides tables showing the rates for each stratum from 2001 to 2011-2012 for the combined landline and list samples. The cell sample extended interview rates declined slightly from 2009 to 2011-2012, but the large increase in screener response meant that the overall response rates for the cell sample were all higher than in 2009, and as noted earlier surpassed the rates for the landline/list sample. Finally, the increase in cell sample response rates more than offset the decrease in the landline/list sample, so that combined overall response rates were all higher in 2011-2012 than in 2009.

7.3 Comparisons of Response Rates with Other Telephone Surveys

In this section we compare the response rates from CHIS 2011-2012 to those from other RDD surveys of 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 McCarty (2003). Publications with definitions of response rates by AAPOR (The American Association for Public Opinion Research, 2011) are attempts to address this problem. This section includes only RDD surveys conducted in California between 2011 and 2012. Earlier reports covered those conducted prior to 2012.

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 documentation on the 2011 BRFSS and its data quality is available from the CDC web site (http://www.cdc.gov/brfss/pdf/2011_Summary_Data_Quality_Report.pdf). In the BRFSS, one adult in each household is sampled and asked to complete an interview of about 20 minutes on health-related topics. The BRFSS interview is about 15 minutes shorter than CHIS 2011-2012 and does not have multiple interviews within the household. Nonetheless, it is probably more similar to CHIS than any other survey for which detailed response rate information is available.

The 2011 BRFSS Summary Data Quality Report (Centers for Disease Control, 2013) includes information about its response rates. The report shows detailed disposition codes, very much in the spirit of the AAPOR recommendations. Despite the detail given, it is very difficult to map the 2011 California BRFSS disposition codes unambiguously to the corresponding disposition codes used in CHIS 2011-2012

because different survey organizations use different classification schemes to create the disposition codes. The codes from both systems provide much needed information for survey operations, but they are not the same. Such differences make direct comparisons between surveys difficult.

Several cooperation and response rates are reported for the 2011 California BRFSS in Tables 7a, 7b, and 8 of the BRFSS Summary Data Quality Report. The rate that is closest to the definition used in CHIS is the overall response rate. For 2011 California BRFSS, the overall response rate is 35.4 percent. This response rate is 17.1 points higher than the CHIS 2011-2012 overall household response rate as reported in the previous sections.

In an attempt to better understand the comparison between the CHIS and BRFSS response rates, we mapped the raw final disposition numbers for California in the BRFSS Summary Data Quality Report into categories as comparable to those used in CHIS as possible. The broad categories needed to calculate the CHIS-style response rate are (1) complete and partial complete, (2) nonresponse, (3) residential status not determined, and (4) ineligible (BRFSS disposition codes beginning with 1 through 4, respectively). Largely, the BRFSS codes and their mapping to these categories match CHIS, with some important differences.

BRFSS includes more detailed disposition codes than CHIS, and makes finer distinctions between those classified as nonresponse and those classified as “residential status not determined.” There are also differences in how some of the disposition codes are treated. For example, if a telephone number becomes nonworking during the field period, after one or more attempts where the number appeared to be working, CHIS classifies the number as ineligible, while BRFSS considers it residential status not determined. Thus, the BRFSS code 355 was classified as ineligible for CHIS purposes. If the person answering the phone simply hangs up without saying anything, CHIS counts the call as nonresponse, while BRFSS counts it as residential status not determined. This is a major difference between the two surveys.

With all of these adjustments and applying the BRFSS definitions and methodology to the CHIS 2011-2012 sample, we computed the equivalent to the BRFSS AAPOR RR4 response rate. This response rate is computed over both the screener and the extended interview as one interview. As noted earlier in the report, because the counties are oversampled, a weighted response rate is also required for this CHIS rate. Table 7-4 shows the comparable rates for the landline, cell phone and combined landline, and cell phone samples. Calculated in this way, the CHIS 2011-2012 rates are higher than the 2011 BRFSS rates. The difference in the cell phone sample is close to 12 percentage points. The combined landline and cell rate in the table (38.6 percent) was computed using the same landline and cell phone factors as those used

in the 2011 BRFSS. If we compute these factors using the CHIS weights, the combined response rate is 35.1 percent.

Table 7-4. 2011 CA BRFSS and CHIS 2011-2012 unconditional response rates using the BRFSS definitions

Sample	Survey response rate (%)	
	BRFSS- 2011	CHIS 2011-2012
Landline	37.43	39.50
Cell phone	20.43	32.12
Combined landline and cell phone	35.40	38.62*

* Combined rate computed using the same BRSFF 2011 landline and cell phone factors.

One difference between the two disposition classification systems that we did not reconcile in this exercise was the definition of “partial interview.” Each survey’s response rates include partial interviews according to the survey’s own definition. But, the BRFSS definition includes many more cases than does the CHIS definition. If this difference were taken into account, then the CHIS response rates shown in 7-4 would be higher than those shown, or the BRFSS rates would be lower, depending upon which survey was adjusted.

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APPENDIX A

Table A-1. Screener response rates for the landline/list sample by sampling stratum from CHIS 2001 to CHIS 2011-2012

Stratum	Description	Cycle					
		2001	2003	2005	2007	2009	2011-2012
	State total	59.2	55.9	49.8	35.5	36.1	31.6
1	Los Angeles	56.9	51.0	46.6	31.5	34.9	29.2
2	San Diego	59.9	56.8	48.1	34.7	35.5	31.3
3	Orange	59.0	54.2	46.8	32.5	36.6	28.7
4	Santa Clara	57.1	57.1	45.7	35.1	32.0	29.4
5	San Bernardino	63.7	61.0	53.7	37.9	37.4	33.0
6	Riverside	62.2	59.1	52.7	37.1	35.5	33.1
7	Alameda	57.6	54.9	49.4	36.2	36.6	29.4
8	Sacramento	61.3	60.3	53.0	38.0	36.4	32.4
9	Contra Costa	57.6	58.8	51.5	36.4	35.9	30.2
10	Fresno	64.0	59.5	57.2	36.3	36.3	32.6
11	San Francisco	50.7	44.2	43.1	26.3	27.4	25.2
12	Ventura	59.4	57.1	52.4	39.2	35.5	34.6
13	San Mateo	53.8	54.6	45.6	31.1	32.6	28.1
14	Kern	68.9	62.9	55.3	44.0	40.5	37.6
15	San Joaquin	64.7	58.1	55.7	36.8	36.4	34.3
16	Sonoma	61.3	56.6	52.4	38.8	37.9	34.7
17	Stanislaus	65.7	61.0	56.5	39.9	38.7	34.4
18	Santa Barbara	62.1	61.0	52.1	48.1	36.9	36.4
19	Solano	61.5	61.9	51.8	36.8	32.3	30.2
20	Tulare	67.7	66.2	57.5	41.5	41.5	41.2
21	Santa Cruz	57.7	57.7	55.4	39.6	40.7	36.3
22	Marin	54.7	54.5	49.0	38.7	37.8	29.6
23	San Luis Obispo	61.6	64.4	56.3	50.6	42.4	38.0
24	Placer	60.3	60.9	52.5	42.1	37.7	35.5
25	Merced	66.2	61.4	55.1	40.0	39.6	33.4
26	Butte	67.3	63.8	60.3	44.9	45.9	40.0
27	Shasta	65.7	63.2	61.8	50.1	44.1	41.4
28	Yolo	66.2	64.4	56.2	44.0	36.9	36.0
29	El Dorado	57.8	59.4	54.3	41.0	35.9	37.2
30	Imperial	67.0	62.0	51.3	34.8	36.9	41.9
31	Napa	59.0	56.4	47.3	36.4	38.9	32.6
32	Kings	65.5	60.1	58.7	40.1	37.8	35.7
33	Madera	67.8	62.2	57.4	41.8	39.7	41.3
34	Monterey*	60.7	58.1	47.5	35.2	40.1	35.0
35	Humboldt*	66.5	64.3	60.9	47.6	48.0	44.1
36	Nevada *	59.5	58.8	53.6	38.2	36.6	39.2
37	Mendocino*	60.9	61.8	51.6	43.2	39.5	42.8
38	Sutter*	66.2	67.3	55.4	40.1	40.8	38.4
39	Yuba*	66.2	67.3	57.3	42.5	40.3	35.9
40	Lake*	60.9	61.8	54.8	38.2	35.9	38.1
41	San Benito*	60.7	58.1	54.8	45.4	41.0	34.0
42	Tehama, Glen, Colusa	68.9	68.0	57.2	46.9	46.2	43.8
43	North Balance*	66.5	65.4	60.5	42.2	49.0	48.5
44	Sierra Balance*	58.0	57.2	53.0	42.5	42.2	36.4

* These strata included other counties in 2001 and 2003. See <http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx> for details

Source: UCLA Center for Health Policy Research, 2001, 2003, 2005, 2007, 2009, and 2011-2012 California Health Interview Survey.

Table A-2. Adult extended interview response rates for the landline/list sample by sampling stratum from CHIS 2001 to CHIS 2011-2012

Stratum	Description	Cycle					
		2001	2003	2005	2007	2009	2011-2012
	State total	63.7	60.0	54.0	52.8	49.0	47.4
1	Los Angeles	60.0	55.1	50.5	48.7	43.6	42.8
2	San Diego	63.3	60.7	53.5	53.0	46.0	47.0
3	Orange	60.3	58.0	50.8	50.5	48.7	46.0
4	Santa Clara	61.2	64.3	55.9	55.7	52.9	48.5
5	San Bernardino	64.0	59.5	53.2	51.7	50.4	46.2
6	Riverside	64.7	58.7	52.0	50.4	51.4	45.2
7	Alameda	65.2	62.1	59.2	56.0	52.0	52.7
8	Sacramento	65.7	63.0	58.0	57.8	55.0	49.8
9	Contra Costa	64.9	66.3	59.6	56.9	51.8	52.6
10	Fresno	59.8	61.6	55.0	52.5	53.3	50.4
11	San Francisco	59.1	59.9	55.9	54.5	47.2	49.2
12	Ventura	63.7	60.3	49.5	54.1	52.4	49.4
13	San Mateo	60.4	61.4	58.3	55.3	50.9	48.2
14	Kern	66.6	65.5	51.9	53.9	47.0	47.2
15	San Joaquin	63.7	59.2	52.7	47.9	48.8	46.7
16	Sonoma	67.8	67.0	62.7	60.2	52.8	53.6
17	Stanislaus	64.2	62.4	56.3	52.5	51.1	46.8
18	Santa Barbara	66.1	64.6	53.5	58.8	54.1	48.1
19	Solano	63.9	60.8	53.9	53.0	45.0	49.1
20	Tulare	64.6	64.7	54.9	51.7	45.2	44.0
21	Santa Cruz	68.3	64.0	59.8	59.2	55.7	51.9
22	Marin	70.4	65.2	59.0	62.1	56.1	57.7
23	San Luis Obispo	69.7	64.9	62.1	65.3	59.3	58.0
24	Placer	68.2	63.0	56.6	55.6	56.8	47.9
25	Merced	64.0	57.7	57.7	50.6	49.6	47.3
26	Butte	67.6	69.5	61.2	65.6	55.2	57.0
27	Shasta	69.4	66.7	64.2	63.0	58.7	53.4
28	Yolo	69.3	66.3	59.5	61.2	56.4	55.3
29	El Dorado	67.6	64.4	60.7	57.7	54.5	56.4
30	Imperial	63.5	61.9	55.5	48.0	40.6	46.3
31	Napa	66.6	65.4	56.8	55.5	50.5	50.7
32	Kings	66.6	61.7	52.6	51.9	45.5	49.2
33	Madera	67.3	59.9	56.3	51.7	48.4	52.5
34	Monterey*	62.9	63.1	53.2	52.2	48.4	49.9
35	Humboldt*	69.6	71.0	64.9	64.6	65.7	57.9
36	Nevada *	70.5	66.1	64.0	61.7	56.8	57.3
37	Mendocino*	68.6	67.8	66.6	62.7	60.4	57.1
38	Sutter*	64.6	64.7	56.3	56.5	49.8	49.5
39	Yuba*	64.6	64.7	59.6	53.9	47.2	47.0
40	Lake*	68.6	67.8	58.4	60.0	57.9	55.0
41	San Benito*	62.9	63.1	48.0	51.6	46.2	46.0
42	Tehama, Glen, Colusa	65.9	63.0	63.9	56.8	55.1	52.5
43	North Balance*	69.6	72.3	67.7	66.2	58.0	62.1
44	Sierra Balance*	72.4	69.1	61.8	62.3	59.1	56.6

* These strata included other counties in 2001 and 2003. See <http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx> for details.

Source: UCLA Center for Health Policy Research, 2001, 2003, 2005, 2007, 2009, and 2011-2012 California Health Interview Survey.

Table A-3. Child extended interview response rates for the landline/list sample by sampling stratum from CHIS 2001 to CHIS 2011-2012

Stratum	Description	Cycle					
		2001	2003	2005	2007	2009	2011-2012
	State total	87.6	81.4	75.2	73.7	72.9	73.2
1	Los Angeles	83.7	80.2	72.1	70.7	70.6	69.7
2	San Diego	88.5	84.2	74.8	72.5	70.2	74.9
3	Orange	84.5	77.5	73.1	72.2	71.4	75.2
4	Santa Clara	92.2	80.7	77.6	75.1	79.0	71.6
5	San Bernardino	91.2	80.3	76.9	69.9	72.9	75.0
6	Riverside	90.8	83.2	73.2	71.7	73.8	70.5
7	Alameda	90.3	81.1	75.6	81.4	73.9	79.7
8	Sacramento	86.3	77.8	78.3	78.6	77.3	74.9
9	Contra Costa	88.9	79.7	80.7	76.3	68.5	65.2
10	Fresno	88.9	86.2	79.9	74.5	71.7	79.2
11	San Francisco	88.5	79.4	73.2	69.0	65.6	75.1
12	Ventura	85.4	88.7	78.6	78.9	77.1	74.3
13	San Mateo	84.5	80.6	76.3	78.4	67.8	61.4
14	Kern	89.2	79.9	79.7	73.6	75.7	83.0
15	San Joaquin	89.9	86.7	78.5	77.7	80.2	69.7
16	Sonoma	95.0	91.1	78.1	79.9	82.0	70.9
17	Stanislaus	85.8	84.7	67.1	79.6	70.4	71.3
18	Santa Barbara	89.7	86.2	76.7	74.7	77.7	81.8
19	Solano	87.0	73.3	79.5	79.7	62.2	69.8
20	Tulare	91.0	77.2	69.2	78.1	64.4	75.4
21	Santa Cruz	88.6	80.2	77.6	79.6	79.6	74.9
22	Marin	89.1	88.3	80.2	70.8	75.1	77.9
23	San Luis Obispo	93.1	87.6	82.8	82.3	74.5	84.1
24	Placer	90.5	79.4	85.9	81.8	84.0	71.2
25	Merced	86.7	80.9	73.8	68.2	74.2	76.8
26	Butte	89.6	93.2	78.9	79.7	81.4	76.5
27	Shasta	87.0	86.9	89.5	72.0	85.5	94.6
28	Yolo	95.2	82.1	73.4	78.4	75.7	81.2
29	El Dorado	92.5	81.6	77.7	73.3	77.3	83.3
30	Imperial	82.4	72.1	68.5	74.4	72.7	74.5
31	Napa	84.0	89.1	81.0	70.4	72.0	77.0
32	Kings	89.5	88.2	81.4	68.4	69.0	78.9
33	Madera	85.6	85.1	80.1	84.6	79.0	71.7
34	Monterey*	87.2	81.8	76.7	69.9	74.1	69.7
35	Humboldt*	92.9	84.9	84.1	87.7	83.9	82.1
36	Nevada *	90.0	82.0	72.7	79.2	87.9	81.2
37	Mendocino*	87.8	87.5	84.6	73.3	75.9	73.5
38	Sutter*	90.4	92.1	79.3	66.8	71.7	83.1
39	Yuba*	90.4	92.1	79.8	76.6	71.0	87.1
40	Lake*	87.8	87.5	64.5	80.7	84.0	72.1
41	San Benito*	87.2	81.8	67.5	71.1	69.9	74.8
42	Tehama, Glen, Colusa	90.7	80.0	78.1	83.4	68.0	81.3
43	North Balance*	96.1	92.0	90.8	90.5	90.6	82.0
44	Sierra Balance*	93.7	89.8	82.1	83.1	78.8	84.0

* These strata included other counties in 2001 and 2003. See <http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx> for details

Source: UCLA Center for Health Policy Research, 2001, 2003, 2005, 2007, 2009, and 2011-2012 California Health Interview Survey.

Table A-4. Adolescent extended interview response rates for the landline/list sample by sampling stratum from CHIS 2001 to CHIS 2011-2012

Stratum	Description	Cycle					
		2001	2003	2005	2007	2009	2011-2012
	State total	63.5	57.3	48.5	44.1	42.8	42.7
1	Los Angeles	58.5	56.5	43.8	41.9	40.3	41.0
2	San Diego	62.1	59.8	46.8	39.7	42.7	49.0
3	Orange	52.3	49.1	47.9	42.3	38.2	37.5
4	Santa Clara	60.1	60.0	53.6	46.3	40.2	34.4
5	San Bernardino	68.0	55.4	50.0	41.3	36.2	47.9
6	Riverside	64.8	55.2	49.4	45.2	43.5	42.2
7	Alameda	57.9	56.2	45.3	48.5	50.4	46.8
8	Sacramento	65.3	53.3	55.9	46.4	46.2	45.1
9	Contra Costa	64.1	64.8	53.6	48.5	49.4	33.2
10	Fresno	64.3	57.5	51.8	42.2	46.5	54.2
11	San Francisco	51.4	58.0	46.2	31.7	42.3	34.4
12	Ventura	60.6	60.8	46.9	48.6	42.8	33.8
13	San Mateo	65.0	51.1	52.6	52.4	42.6	30.5
14	Kern	66.2	58.1	57.9	46.2	45.8	49.0
15	San Joaquin	65.7	52.3	48.9	43.5	42.8	44.7
16	Sonoma	65.3	56.7	48.9	44.4	56.0	66.5
17	Stanislaus	60.7	60.9	54.0	51.1	44.8	41.8
18	Santa Barbara	63.2	67.3	59.6	46.5	48.8	63.8
19	Solano	65.6	60.3	45.0	45.9	47.0	37.8
20	Tulare	63.7	62.4	46.7	37.7	43.7	39.1
21	Santa Cruz	70.5	68.6	56.5	50.9	47.7	47.9
22	Marin	61.2	58.4	54.8	48.1	45.8	38.2
23	San Luis Obispo	65.0	63.0	55.0	54.5	40.4	60.0
24	Placer	70.1	67.0	50.7	44.4	44.4	38.2
25	Merced	65.2	64.8	45.1	37.8	42.9	44.4
26	Butte	64.5	60.7	56.1	60.0	55.0	49.0
27	Shasta	63.2	54.5	50.7	54.5	56.7	39.6
28	Yolo	68.8	58.7	61.5	55.5	58.0	42.8
29	El Dorado	74.2	57.9	59.4	54.4	47.3	41.3
30	Imperial	70.6	66.4	49.5	50.8	47.4	46.2
31	Napa	61.1	68.5	41.8	54.8	33.4	49.1
32	Kings	70.1	64.4	46.8	34.7	40.3	62.6
33	Madera	70.4	68.6	58.8	54.1	43.5	36.0
34	Monterey*	66.4	56.0	46.5	44.1	35.8	44.1
35	Humboldt*	69.1	60.9	44.2	61.7	59.7	58.7
36	Nevada *	78.8	72.0	48.9	51.1	48.9	52.4
37	Mendocino*	67.9	62.4	59.4	49.9	44.8	45.7
38	Sutter*	65.9	70.8	62.0	49.7	34.3	41.8
39	Yuba*	65.9	70.8	57.7	34.7	53.0	45.3
40	Lake*	67.9	62.4	52.6	46.5	66.8	52.2
41	San Benito*	66.4	56.0	58.3	45.1	41.3	44.5
42	Tehama, Glen, Colusa	70.4	57.0	54.2	48.7	45.8	49.7
43	North Balance*	68.1	69.7	61.8	54.5	54.4	34.6
44	Sierra Balance*	75.2	62.5	49.7	43.9	52.5	35.0

*These strata included other counties in 2001 and 2003. See <http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx> for details.

Source: UCLA Center for Health Policy Research, 2001, 2003, 2005, 2007, 2009, and 2011-2012 California Health Interview Survey.