Report 4

Response Rates

CALIFORNIA HEALTH INTERVIEW SURVEY

<u>CHIS 2013-2014 METHODOLOGY SERIES</u>

REPORT 4

RESPONSE RATES

JANUARY, 2016

www.chis.ucla.edu

This report provides analysts with information about the response rates in CHIS 2013-2014. 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 2013-2014 California Health Interview Survey (CHIS 2013-2014). 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 2013-2014 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 2013-2014

The methodological reports for the CHIS 2013-2014 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 2013-2014 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 2013-2014 SAMPLE DESIGN AND METHODOLOGY SUMMARY

1.1   Overview

This chapter provides a high-level summary of major design components of the California Health Interview Survey (CHIS) and appears at the beginning of each of the five detailed methodology reports for the cycle. You may need to reference those reports to find the level of detail you need. CHIS methodology reports and other methodological documentation and research is online at http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx.

The CHIS is a population-based telephone survey of California's population conducted every other year since 2001 and continually beginning in 2011. CHIS is the largest state health survey 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 and the Department of Health Care Services. 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 (for many examples of these studies, visit the Center's publication page (http://healthpolicy.ucla.edu/publications/Pages/default.aspx).

This series of reports describes the methods used in collecting data for CHIS 2013-2014, the sixth CHIS data collection cycle. The previous CHIS cycles (2001, 2003, 2005, 2007, 2009, and 2011-2012) are described in similar series 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 have been 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.

CHIS 2013-2014 data were collected between February 2013 and early January 2015. Approximately half of the interviews were conducted during the 2013 calendar year and half during the 2014 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 thus not eligible to participate in CHIS. When the weights are applied to the data, the results represent California's residential population during that two year period for the age group corresponding to the data file in use (adult, adolescent, or child).

See what's new in the 2013-2014 CHIS sampling and data collection here:
http://healthpolicy.ucla.edu/chis/design/Documents/whats-new-chis-2013-2014.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 2013-2014 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 to this report above.

1.3   Sample Design Objectives

The CHIS 2013-2014 sample was designed to meet the two sampling objectives discussed above: (1) provide estimates for adults in most counties and in 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 designed to achieve completed adult interviews with 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 the two most populous counties 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 Districts. 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). CHIS 2013-2014 also included supplemental geographic oversamples of landlines in 3 small counties (Calaveras, Siskiyou, and Tuolumne) that were part of multi-county strata. An address-based sample of an additional 500 households was conducted in Sonoma County and oversamples of about 130 Japanese Americans, 104 Korean Americans, and 120 Vietnamese Americans were completed using list samples. 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 landline 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. Surname and given name lists were used similarly to increase the yield of Californians of Japanese descent.

Table 1-1.   California county and county group strata used in the CHIS 2013-2014 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,
4. Santa Clara	24. Placer	Lassen, Modoc, Trinity, Del Norte
5. San Bernardino	25. Merced	44. Mariposa, Mono, Tuolumne,
6. Riverside	26. Butte	Alpine, Amador, Calaveras, Inyo

Source: UCLA Center for Health Policy Research, 2013-2014 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 2013-2014, the goal was to complete approximately 8,000 interviews (20% of all RDD interviews statewide) with adults from the cell phone sample. Although the geographic information available for cell phone numbers is not as precise as that for landlines, cell phone numbers were assigned to the same 43 strata (i.e., 40 strata defined by a single county and 3 strata created by multiple counties). The cell phone stratification closely resembles that of the landline sample and has the same stratum names, though the cell phone strata represent slightly different geographic areas than the landline strata. As in CHIS 2011-2012, 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 480 teen interviews and 1,250 child interviews were completed from the cell phone sample in CHIS 2013-2014.

The cell phone sampling method used in CHIS has evolved since its first implementation in 2007 when only cell numbers belonging to adults in cell-only households were eligible for sampling adults. There have been two significant changes to the cell phone sample since 2009. First, all cell phone sample numbers used for non-business purposes by adults living in California were eligible for the extended interview. 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 was the inclusion of child and adolescent extended interviews.

The cell phone sample design and targets by stratum of the cell phone sample have also changed throughout the cycles of the survey. In CHIS 2007 a non-overlapping dual-frame design was implemented where cell phone only users were screened and interviewed in the cell phone sample. Beginning in 2009, an overlapping dual-frame design has been implemented. In this design, dual phone users (e.g., those with both cell and landline service) can be selected and interviewed from either the landline or cellphone samples.

The number of strata has also evolved as more information about cell numbers has become available. In CHIS 2007 the cell phone frame was stratified into 7 geographic sampling strata created using telephone area codes. In CHIS 2009 and 2011-2012, the number of strata was increased to 28. These strata were created using both area codes and the geographic information assigned to the number. In CHIS 2011-2013, with the availability of more detailed geographic information, the number of strata was increased to 43 geographic areas that correspond to single and grouped counties similar to the landline strata.

1.4 Data Collection

To capture the rich diversity of the California population, interviews were conducted in six languages: English, Spanish, Chinese (Mandarin and Cantonese dialects), Vietnamese, Korean, and, for the first time, Tagalog. These languages were chosen based on analysis of 2010 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 2013-2014 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 their parent or legal guardian. Thus, up to three interviews could have been completed in each household. Children and adolescents were generally sampled at the end of the adult interview. In landline, list, and ABS sample households with children where the screener respondent was someone other than the sampled adult, 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 first used in CHIS 2005 and has been continued in subsequent CHIS cycles because it substantially increases the yield of child interviews. While numerous subsequent attempts were made to complete the adult interview for child-first cases, the final data contain completed child and 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 2013-2014 by the type of sample (landline RDD, surname list, cell RDD, and Sonoma ABS). These numbers are provided in greater detail in Chapter 6 of this report/ *CHIS 2013-2014 Methodology Series: Report 2 – Data Collection*. Note that these figures were accurate as of data collection completion and may differ slightly from numbers in the data files due to data cleaning and edits. Sample sizes to compare against data files you are using are found online at http://healthpolicy.ucla.edu/chis/design/Pages/sample.aspx.

Table 1-2.   Number of completed CHIS 2013-2014 interviews by type of sample and instrument

Type of sample	Adult*	Child	Adolescent
Total all samples	40,240[1]	5,512	2,253
Landline RDD	31,615	4,164	1,738
Surname list	392	50	18
Cell RDD	7,752	1,256	482
Sonoma ABS	481	42	15

*Includes interviews meeting the criteria as partially complete
Source: UCLA Center for Health Policy Research, 2013-2014 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 36 minutes to complete. The average child and adolescent interviews took about 16 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 11 percent of the adult interviews were completed in a language other than English, as were about 23 percent of all child (parent proxy) interviews and 5 percent of all adolescent interviews.

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[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 shows the major topic areas for each of the three survey instruments (adult, child, and adolescent).

Table 1-3.   CHIS 2013-2014 survey topic areas by instrument

Health status	Adult	Teen	Child
General health status	✓	✓	✓
Days missed from school due to health problems		✓	✓

Health conditions	Adult	Teen	Child
Asthma	✓	✓	✓
Diabetes, gestational diabetes, pre- /borderline diabetes	✓		
Heart disease, high blood pressure	✓		
Physical disability	✓		
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	✓	✓	✓
Cigarette use, second-hand smoke, attitudes about smoking	✓	✓	
Alcohol use	✓	✓	
Sexual behavior	✓		
HIV/STI testing	✓		
Sedentary time		✓	✓

Dental health	Adult	Teen	Child
Last dental visit	✓	✓	✓
Main reason haven't visited dentist	✓	✓	
Current dental insurance coverage	✓	✓	✓

Neighborhood and housing	Adult	Teen	Child
Social cohesion	✓	✓	✓
Neighborhood safety	✓	✓	✓
Homeownership, length of time at current residence	✓		
Park use		✓	✓
Civic engagement	✓	✓	

Table 1-3.   CHIS 2013-2014 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	✓	✓	✓
Inpatient hospital stays	✓		
Delays in getting care (prescriptions and medical care)	✓	✓	✓
Patient-centered care, timely appointments, care coordination	✓	✓	✓
Communication problems with doctor	✓		✓
Problems finding a doctor	✓		✓
Use of specialists	✓		
Advance directive (Sonoma County)	✓		
Internet use for health information	✓		✓
Contraception (counseling, prescription, male birth control)	✓		

Food environment	Adult	Teen	Child
Access to fresh and affordable foods	✓		
Fast food at school, School lunch consumption		✓	✓
Water availability		✓	
Water consumption	✓	✓	
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	✓	✓	✓
Coverage through Covered California	✓	✓	✓
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/CalFresh, 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	✓	✓	✓

Parental involvement/adult supervision	Adult	Teen	Child
Parental involvement			✓

Table 1-3.   CHIS 2013-2014 survey topic areas by instrument (continued)

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			✓
Special programs in school		✓	
Grades, college expectations		✓	
Organizational involvement, civic engagement		✓	
School instability		✓	

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	✓		
Alimony/child support	✓		
Worker's compensation, Social Security, pensions	✓		

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, 2013-2014 California Health Interview Survey.

1.5   Response Rates

The overall response rate for CHIS 2013-2014 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 50.7 percent of the landline

RDD sample telephone numbers not identified by the sample vendor as business or nonworking numbers, and for 82.2 percent of surname list sample 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 2013-2014 advance letter to encourage cooperation.

The CHIS 2013-2014 screener response rate for the landline/list sample was 28.8 percent, and was higher for households that were sent the advance letter. For the cell phone sample, the screener response rate was 30.7 percent. The extended interview response rate for the landline/list sample varied across the adult (44.8 percent), child (68.9 percent) and adolescent (40.2 percent) interviews. The adolescent rate includes getting permission from a parent or guardian. The adult interview response rate for the cell sample was 52.1 percent, the child rate was 72.2 percent, and the adolescent rate 41.0 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 2013-2014, the landline/list sample household response rate was 14.8 percent (the product of the screener response rate and the extended interview response rate at the household level of 51.4 percent). The cell sample household response rate was 16.6 percent, incorporating a household-level extended interview response rate of 53.9 percent. All of the household and person level response rates vary by sampling stratum. For more information about the CHIS 2013-2014 response rates please see *CHIS 2013-2014 Methodology Series: Report 4 – Response Rates*.

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 2013 California BRFSS landline response rate is 38.9 percent, the cell phone response rate is 39.3 percent, and the combined landline and cell phone rate is 39.0 percent.[2] Recalculating the CHIS response rates using the BRFSS method, the CHIS 2013-2014 landline response rate is 39.5, cell phone response rate is 32.1 percent, and the combined landline and cell phone response rate is 37.2 percent. California as a whole and the state's urban areas in particular are among the most difficult parts of the nation in which to conduct telephone interviews. For example, based on the last reported BRFSS refusal rates in 2011; the refusal rate for California (31.4%) was the highest in the nation and was 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.

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[2] As reported in the Behavioral Risk Factor Surveillance System: 2013 Summary Data Quality Report. Retrieved May 22, 2015, available online at http://www.cdc.gov/brfss/annual_data/2013/pdf/2013_dqr.pdf

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 were missing from those cases that did not complete the entire interview. They were imputed to enhance the analytic utility of the data (see section 2.6 on imputation methods for more information).

Proxy interviews were conducted for any adult who was unable to complete the extended adult interview for themselves, in order to avoid biases for health estimates of chronically-ill or handicapped people. Eligible selected persons were re-contacted and offered a proxy option. For 248 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 2013-2014 accomplish the following objectives:

- Compensate for differential probabilities of selection for households and persons;

- Reduce biases occurring because non-respondents 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 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 2013-2014 were created primarily from the California Department of Finance's (DOF) 2014 Population Estimates and 2014 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.

The 2014 DOF control totals used to create the CHIS 2013-2014 weights are based on 2010 Census counts, as were those used for the 2011-2012 cycle. Please pay close attention when comparing estimates using CHIS 2013-2014 data with estimates using data from CHIS cycles before 2010. 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 2009 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 2013-2014 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 every other variable.

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 methods 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 non-respondents form 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. Westat used hot deck imputation to impute the same items in all CHIS cycles since 2003 (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 2013-2014 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 continues 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 standard measures of demographic and socioeconomic characteristics, as well as geographic region; however, the full set of control variables varies depending on which variable is being imputed. Most imputation models included additional characteristics, such as health status or access to care, which are used to improve the quality of the donor-recipient match. Among the standard list of control variables, gender, age, race/ethnicity and region of California were imputed by Westat. UCLA-CHPR began their imputation process by imputing household income and educational attainment, so that these characteristics were available for the imputation of other variables. CHIS collects bracketed information about the range in which the respondent's value falls when the respondent will not or cannot report an exact amount. Household income, for example, was imputed using the hot-deck method within ranges defined by a set of auxiliary variables such as bracketed income range and/or poverty level. After all other variables are imputed, household income is re-imputed using a more detailed list of covariates to create a higher quality match between donors and recipients.

The imputation order of the other variables generally followed their order in 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 2013-2014:

- 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 a 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 2013-2014 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, 2015). 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

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

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

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 AAPOR (The American Association for Public Opinion Research, 2015). 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 2013-2014 (landline, list, and cell phone samples). The mixed-mode address-based sample (ABS) in Sonoma County is excluded from the computation of overall 2013-2014 CHIS response rates so that the rates are comparable with those reported in previous CHIS cycles. Since telephone numbers were sampled with different selection probabilities, we use the weighted number of telephone numbers rather than the number of cases (unweighted) for the response rate computation as discussed in Chapter 2. This approach also compensates for 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 eligibility 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 voice mail or 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 approach 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 has been used in CHIS 2013-2014

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[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

and previous CHIS cycles to estimate e in the landline, list, and cell phone samples; this 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 2013-2014.

In CHIS 2001 and 2003, the adult interview in the landline samples had to be completed before children or adolescents could be interviewed. Beginning in 2005, the child-first procedure[5] 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 by whether an address could be matched to the telephone number. 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 2013-2014.

An alternative approach involves computing the response rate over both the screener and the extended interview as a single interview. This alternative approach is used in the Behavioral Risk Factor Surveillance System (BRFSS); the specifics of the computation of the response rate are given in the 2013

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[5] A complete description of the child-first procedures is found in *CHIS 2013-2014 Methodology Series: Report 2 – Data Collection Methods.*

BRFSS Data Quality Summary report (Centers for Disease Control, 2014). In that report, the combined response rate labeled "AAPOR response rate #4" is the alternative computation. The difference in the computed response rates is substantial, with the 2013 California BRFSS AAPOR response rate #4 almost 3 times higher than the overall response rate in CHIS 2013-2014 response rate. When we discuss comparisons to other surveys we re-compute the rates for CHIS 2013-2014 to give the equivalent of the 2013 BRFSS response rate for comparability.

4. REVIEW OF CONTACT METHODS

CHIS 2013-2014 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 combined 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 2.2 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 32.7 minutes in English, the child interview 14.7 minutes, and the adolescent interview about 22.2 minutes. Interviews in languages other than English generally took longer than these averages. Detailed interview timing information is given in *CHIS 2013-2014 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 2013-2014, that their participation was voluntary but important to the success of the survey, and that the survey was legitimate. The letter contained a two-dollar bill 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 calls 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 2013-2014. A very important procedure involved translating and conducting the interview in Spanish, Chinese (Cantonese and Mandarin dialects), Korean, Vietnamese, and Tagalog to accommodate respondents who did not speak English. Another method was the use of proxy interviews for any adults who were unable to participate because of mental or physical limitations. Other adult household members knowledgeable about the sampled persons' health, usually a parent, spouse, or child of the sampled adult completed a proxy interview in these cases; 271 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 2013-2014. Response rates are calculated for the **screener** 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 rates and should not be used to assess response patterns.

A **screener 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 screener response rate (rr_s) in a single stratum is

$$rr_s = \frac{\sum\limits_{i \in S_{resp}} w_i}{\sum\limits_{i \in S_{resid}} w_i}, \tag{3}$$

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 screener 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 screener response rate in each sample is a weighted average of the stratum screener 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 screener 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 2013-2014) are considered nonrespondents because household-level data were not collected in these cases. The household extended interview response rate rr_h is computed as

$$rr_h = \frac{\sum\limits_{i \in H_{resp}} w_i^*}{\sum\limits_{i \in H_{scr}} w_i^*} , \qquad (4)$$

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 for each **extended interview**. 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

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[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).

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

where the numerator is summed over all adult respondents, and the denominator is summed over all eligible sampled adults. The weight being summed in this case, w', is the adult weight that accounts for selecting the adult. 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

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

where the numerator is summed over all completed child interviews , 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 sampled in the screener, and $rr_{c,\overline{K}}$ is the child extended interview response rate for those sampled in the adult interview.

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

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

where the numerator is summed over all adolescent respondents, and the denominator is summed over all eligible sampled adolescents. The weight being summed in this case, w''', is the inverse of the probability of selecting the adolescent within the household. Again, $rr_{t,K}$ is used to identify the rate for adolescents sampled in the screener, and $rr_{t,\bar{K}}$ is for adolescents who were sampled in the adult interview.

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

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

where the only difference is that the denominator is summed over only those adolescents for whom 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

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

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

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

In the landline/list samples, the **child response rate** is conditioned on the screener being completed and also on the adult interview being completed for households with children where a child was not sampled in the screener. The overall response rate for the child, orr_c is defined as

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

where $rr_{ac,\bar{K}}$ is the extended adult interview response rate for sampled adults in households with children where a child was not sampled in the screener, and p_{Kc} and $p_{\bar{K}c}$ are the proportions of households with children in which the child-first procedure was used (i.e., a child was sampled in the screener) 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

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

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

$$orr_{c\_cell} = rr_{s\_cell} \cdot rr_{ac\_cell} \cdot rr_{c\_cell}, \tag{13}$$

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}.

In addition, we 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

$$orr_{a\_comb} = p_{a\_cell\_only} \cdot orr_{a\_cell\_only} + q_{a\_both} \cdot orr_{a\_both} + r_{a\_landline\_only} \cdot orr_{a\_landline\_only} \tag{14}$$

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 2013-2014 data. These proportions are 0.44, 0.49, and 0.08 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 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

$$orr_{a\_both} = \lambda \cdot orr_{a\_both}^{landline\_smp} + (1-\lambda) \cdot orr_{a\_both}^{cell\_smp} \qquad (15)$$

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 form the two samples. In CHIS 2013-2014 we use $\lambda = 0.50$, the same factor used to combine the cell phone and landline sample in weighting (see *CHIS 2013-2014 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

$$orr_{c\_comb} = p_{c\_cell\_only} \cdot rr_{cell\_s} \cdot rr_{ac\_cell\_only} \cdot rr_{c\_cell\_only}$$
$$+ q_{c\_both}(\lambda \cdot rr_{landline\_s}(p_{Kc} \cdot rr_{c,K} + p_{\bar{K}c} \cdot rr_{ac,\bar{K}} \cdot rr_{c,\bar{K}}) + (1-\lambda) \cdot rr_{cell\_s} \cdot rr_{ac\_both} \cdot rr_{c\_both}) \qquad (16)$$
$$+ r_{c\_lanline\_only} \cdot rr_{landline\_s} \cdot (p_{Kc} \cdot rr_{c,K} + p_{\bar{K}c} \cdot rr_{ac,\bar{K}} \cdot rr_{c,\bar{K}})$$

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

$$orr_{t\_comb} = p_{t\_cell\_only} \cdot rr_{cell\_s} \cdot rr_{at\_cell\_only} \cdot rr_{t\_cell\_only}$$
$$+ q_{t\_both}(\lambda \cdot rr_{landline\_s}(p_{Kt} \cdot rr_{t,K} + p_{\bar{K}t} \cdot rr_{at,\bar{K}} \cdot rr_{t,\bar{K}}) + (1-\lambda) \cdot rr_{cell\_s} \cdot rr_{at\_both} \cdot rr_{t\_both}) \qquad (17)$$
$$+ r_{t\_lanline\_only} \cdot rr_{landline\_s} \cdot (p_{Kt} \cdot rr_{t,K} + p_{\bar{K}t} \cdot rr_{at,\bar{K}} \cdot rr_{t,\bar{K}})$$

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 2013-2014. The first section shows the screener response rates for the combined landline and surname list statewide and by sampling stratum, and the cell phone 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 samples**, by sampling stratum, are given in Table 6-1. The first column in the table gives the number of households in the landline/list samples that completed the screening interview. Overall, 63,042 households from these samples completed the CHIS 2013-2014 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 landline and surname lists, is 28.8 percent, 2.8 percentage points lower than in CHIS 2011-2012. 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 went to voice mail/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 2013-2014 gives a weighted overall state-level cooperation rate of 43.4 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	63,042	28.8	48,452	33.2	14,590	20.1
1	Los Angeles	12,414	28.6	9,309	33.0	3,105	20.8
2	San Diego	6,963	28.4	4,825	33.3	2,138	21.2
3	Orange	3,811	24.8	2,816	29.3	995	17.5
4	Santa Clara	2,119	25.5	1,724	29.5	395	16.5
5	San Bernardino	2,295	29.7	1,728	33.5	567	22.2
6	Riverside	2,505	29.0	1,836	32.5	669	22.5
7	Alameda	1,752	27.0	1,438	30.5	314	17.9
8	Sacramento	1,696	29.5	1,313	35.7	383	18.6
9	Contra Costa	1,161	26.4	964	30.2	197	16.5
10	Fresno	1,019	31.5	832	36.6	187	19.4
11	San Francisco	1,091	22.7	889	27.1	202	13.4
12	Ventura	1,019	30.0	792	33.6	227	22.0
13	San Mateo	853	23.5	717	27.6	136	13.5
14	Kern	857	35.9	662	41.9	195	24.3
15	San Joaquin	738	30.8	590	34.1	148	22.4
16	Sonoma	661	30.5	561	35.0	100	18.0
17	Stanislaus	809	30.1	668	34.6	141	18.7
18	Santa Barbara	777	31.5	605	37.3	172	20.4
19	Solano	811	27.2	668	29.2	143	20.5
20	Tulare	796	35.8	632	38.7	164	27.8
21	Santa Cruz	739	32.3	608	35.8	131	22.5
22	Marin	679	28.2	567	31.4	112	18.8
23	San Luis Obispo	686	36.2	593	41.8	93	19.7
24	Placer	665	31.4	488	37.1	177	22.0
25	Merced	816	33.1	628	37.5	188	24.0
26	Butte	656	39.3	516	43.7	140	28.8
27	Shasta	669	39.7	514	44.7	155	29.0
28	Yolo	691	33.2	570	39.7	121	18.7
29	El Dorado	780	31.5	633	35.9	147	20.6
30	Imperial	816	38.1	650	43.0	166	26.5
31	Napa	733	28.4	633	32.4	100	16.1
32	Kings	873	30.4	714	34.3	159	20.1
33	Madera	806	33.4	575	37.9	231	25.7
34	Monterey	763	31.2	615	36.9	148	18.9
35	Humboldt	591	40.5	507	44.3	84	26.9
36	Nevada	735	31.8	608	36.5	127	19.5
37	Mendocino	713	39.9	557	45.0	156	28.5
38	Sutter	812	32.0	656	35.3	156	22.8
39	Yuba	760	33.0	580	37.4	180	23.9
40	Lake	679	38.7	522	43.0	157	28.9
41	San Benito	839	26.2	680	28.4	159	19.5
42	Colusa, Glenn, Tehama	625	39.9	494	45.8	131	26.9

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)

| | | Total | | Advance letter mailed | | | |
| | | | | Yes | | No | |
	Stratum	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
43	Del Norte, Siskiyou, Lassen, Trinity, Modoc, Plumas, Sierra	1,096	38.0	812	42.2	284	30.5
44	Amador, Alpine, Calaveras, Inyo, Mariposa, Mono, Tuolumne	1,673	34.5	1,163	40.6	510	24.9

Source: UCLA Center for Health Policy Research, 2013-2014 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 31.4 percent, and the highest response rate is 40.5 percent in the stratum for Humboldt. As in previous CHIS cycles, San Francisco has the lowest response rate at 22.7 percent.. The next lowest response rate (San Mateo) is about 0.9 points higher than the San Francisco rate. The screener response rate in Los Angeles is 6.0 points higher than the San Francisco rate and 0.2 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 28.6 percent. This is 4.1 percentage points lower than the 32.7 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 landline response rates by whether an advance letter was mailed to the household. We discuss these rates later.

Figure 6-1.   Landline screener response rate distribution by sampling stratum

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

Table 6-2 shows the **screener response rates** for households from the **cell phone sample** for the state and sampling strata which is also illustrated in Figure 6-2. Overall, 14,264 screener interviews were completed statewide and the state screener response rate was 30.7 percent. The screener response rate in CHIS 2011-2012 was 33.0 percent, so the response rate decreased by 2.3 percentage points in 2013-2014. The response rates for the cell sample in previous cycles were reported at the region level. However, since the cell phone sample in 2013-2014 was drawn separately by areas mapped to a county or group of counties, the cell sample response rates can be reported at the sampling stratum in the same way as for the landline response rates. However, it is important to notice that although the strata have the same name they generally do not represent exactly the same geographic area.

Table 6-2   Number of completed screener interviews and screener response
            rates by sampling stratum for the cell phone sample

	Stratum	Screener interview	
		Complete	Response rate (%)
	State total	14,264	30.7
1	Los Angeles	2,827	32.6
2	San Diego	1,569	29.9
3	Orange	810	29.1
4	Santa Clara	520	26.9
5	San Bernardino	451	30.9
6	Riverside	431	32.8
7	Alameda	453	26.1
8	Sacramento	377	30.7
9	Contra Costa	201	27.8
10	Fresno	226	35.8
11	San Francisco	336	25.7
12	Ventura	234	31.7
13	San Mateo	165	27.4
14	Kern	177	36.5
15	San Joaquin	186	29.4
16	Sonoma	159	27.6
17	Stanislaus	177	31.4
18	Santa Barbara	151	37.8
19	Solano	174	28.8
20	Tulare	183	36.0
21	Santa Cruz	185	32.5
22	Marin	160	27.4
23	San Luis Obispo	136	30.7
24	Placer	149	31.2
25	Merced	207	33.6
26	Butte	149	34.0
27	Shasta	175	26.0
28	Yolo	188	27.8
29	El Dorado	166	28.2
30	Imperial	289	28.6
31	Napa	226	29.4
32	Kings	202	33.6
33	Madera	252	32.4
34	Monterey	174	35.0
35	Humboldt	158	33.5
36	Nevada	157	27.6
37	Mendocino	246	31.9
38	Sutter	510	29.3
40	Lake	151	32.4
41	San Benito	215	29.4
42	Colusa, Glenn, Tehama	122	35.6

Table 6-2   Number of completed screener interviews and screener response
             rates by sampling stratum for the cell phone sample (continued)

	Stratum	Screener interview	
		Complete	Response rate (%)
43	Del Norte, Siskiyou, Lassen, Trinity, Modoc, Plumas, Sierra	103	32.0
44	Amador, Alpine, Calaveras, Inyo, Mariposa, Mono, Tuolumne	137	27.9

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

Figure 6-2. Cell phone screener response rate distribution by sampling stratum
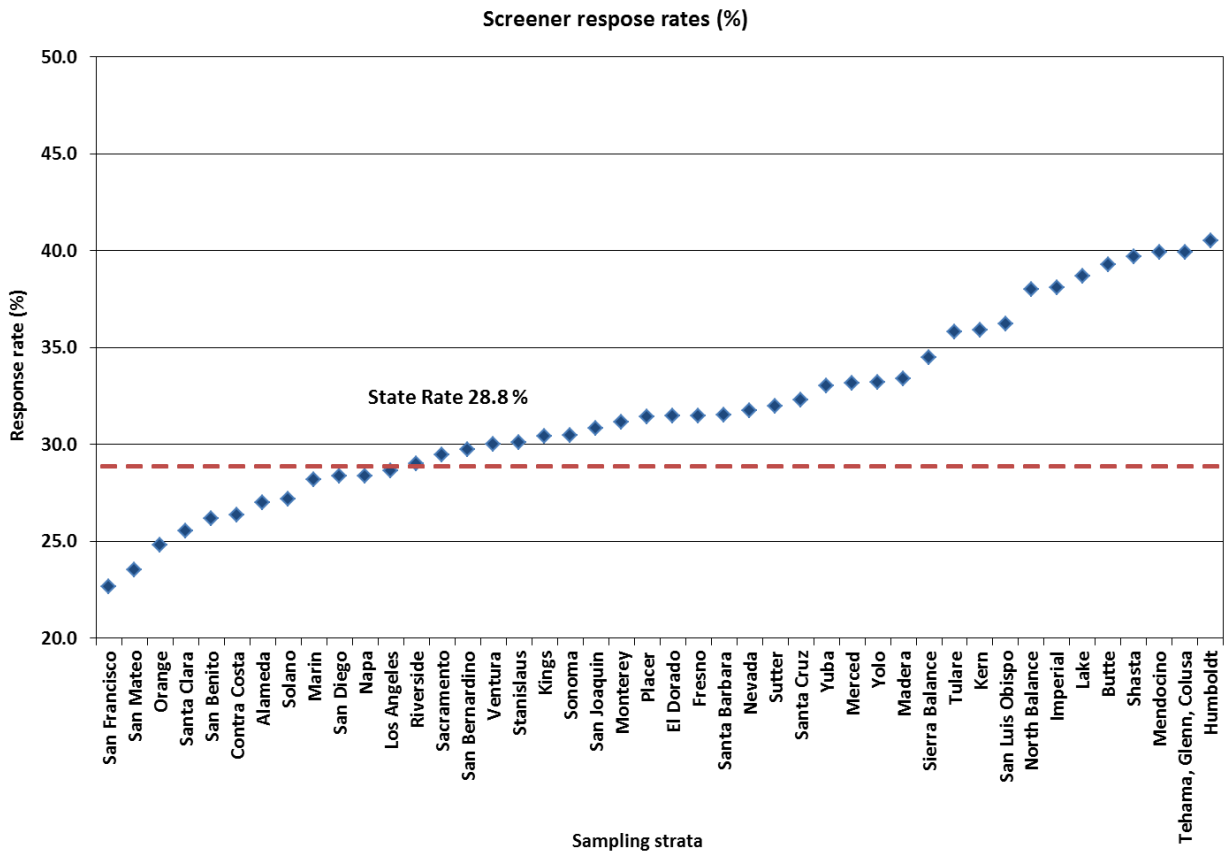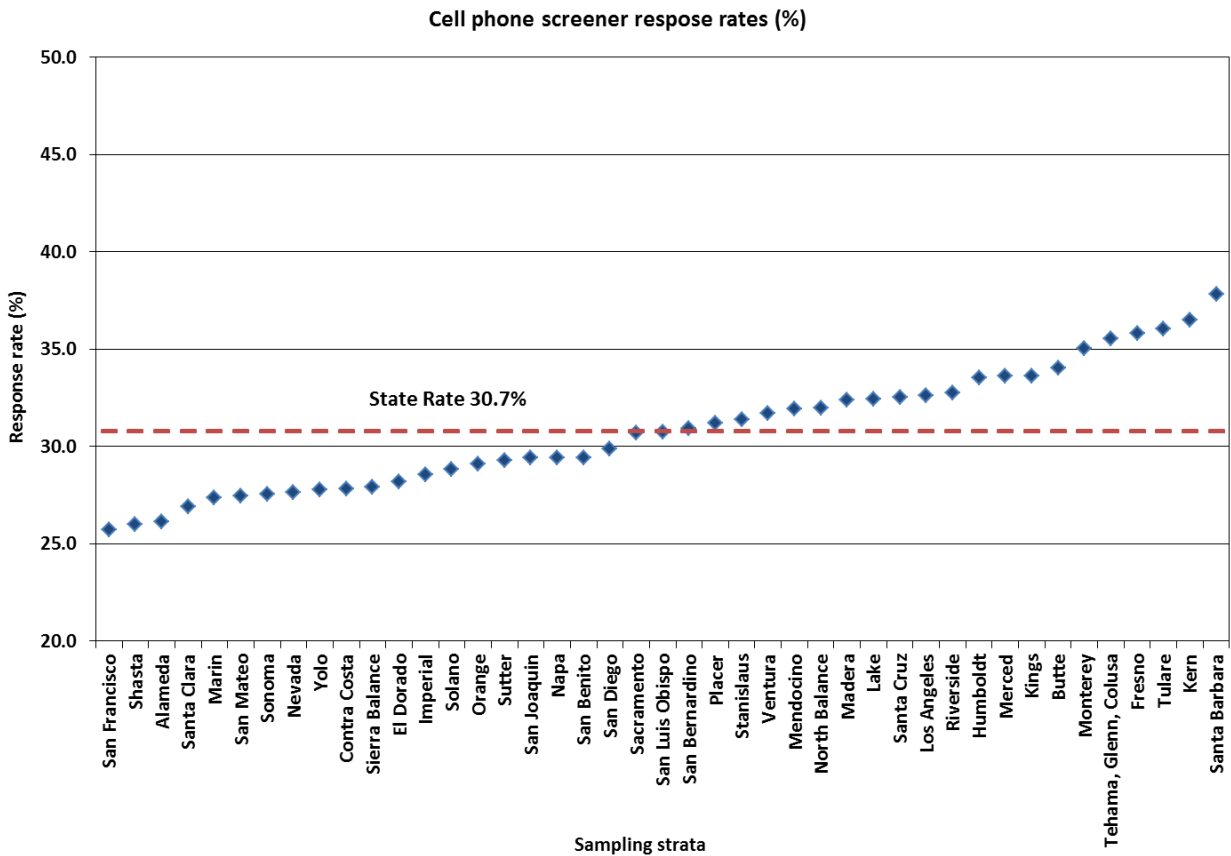

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

Response rates in the cell phone sample range from a low of 25.7 percent in San Francisco County to a high of 37.8 percent in Santa Barbara County. The state level cell phone sample screener response rate is 30.7 percent, which is about 2 percentage points higher than the landline screener response rate. When looking at the telephone sample response rates, it should be noted that these are based on the sampling of telephone number assignment, not self-reported residence (which is not available for nonrespondents). For additional details, see *CHIS 2013-2014 Methodology Series: Report 2 – Data Collection Methods,* which presents a comparison of the final cell sample and landline sample screener dispositions in CHIS 2013-2014.

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 33,236 households where either an adult or child extended interview (or both) was completed, resulting in a statewide household level response rate of 51.4 percent, which is 2.5 percentage points lower than the CHIS 2011-2012 household response rate. Additionally, 32,007 adult interviews, 4,214 interviews about children, and 1,756 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 44.8 percent, a decrease of 2.6 points from CHIS 2011-2012. 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 46.1 percent, while for counties with less than 500,000 the median adult response rate is 48.2 percent. This difference may be attributable to a variety of reasons, including the different distribution of persons by age, education among others, by county. The 2013-2014 child interview state level response rate was 68.9 percent, which is 4.3 percentage points lower than the child response rate observed in CHIS 2011-2012. The state level adolescent interview rate is 40.2 percent, which is 2.5 points lower than the rate observed in CHIS 2011-2012.

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 Complete	Household Response rate (%)	Adult Complete	Adult Response rate (%)	Child Complete	Child Response rate (%)	Adolescent Complete	Adolescent Response rate (%)
	State total	33,236	51.4	32,007	44.8	4,214	68.9	1,756	40.2
1	Los Angeles	5,993	47.7	5,745	41.3	810	68.0	366	41.4
2	San Diego	3,557	50.6	3,419	44.3	489	71.4	177	39.3
3	Orange	1,857	47.7	1,783	40.9	227	62.7	94	38.3
4	Santa Clara	1,145	54.0	1,098	47.2	146	71.8	62	43.9
5	San Bernardino	1,126	48.3	1,066	42.0	189	69.3	69	40.2
6	Riverside	1,263	49.3	1,217	42.8	157	62.7	75	43.1
7	Alameda	1,007	56.7	958	49.5	149	74.9	55	41.0
8	Sacramento	945	54.4	909	46.8	101	66.8	40	42.5
9	Contra Costa	634	52.5	613	46.1	77	69.2	32	37.3
10	Fresno	526	49.4	501	43.2	82	74.2	41	43.0
11	San Francisco	630	57.4	612	50.8	68	66.1	27	39.7
12	Ventura	515	49.7	490	42.8	74	64.4	17	19.9
13	San Mateo	478	55.3	457	47.5	55	62.2	19	30.8
14	Kern	457	52.3	443	47.8	62	74.8	24	41.4
15	San Joaquin	396	52.8	382	47.1	58	72.8	23	30.9
16	Sonoma	399	59.4	386	53.0	39	58.3	21	37.1
17	Stanislaus	422	51.4	413	46.2	45	74.5	16	39.9
18	Santa Barbara	411	51.5	401	45.7	46	71.5	13	32.9
19	Solano	423	51.1	418	46.3	43	64.6	22	49.7
20	Tulare	433	53.3	403	44.2	78	73.5	32	38.1
21	Santa Cruz	415	55.5	403	47.6	45	71.6	14	36.9
22	Marin	417	60.4	407	55.5	44	67.9	20	38.8
23	San Luis Obispo	402	56.5	390	51.2	35	73.0	11	30.5
24	Placer	355	52.2	347	48.2	39	72.3	20	45.5
25	Merced	399	48.1	383	41.9	63	73.8	35	52.5
26	Butte	400	60.1	387	56.0	47	77.5	24	59.2
27	Shasta	415	61.5	398	55.7	48	73.4	19	48.0
28	Yolo	422	60.9	396	50.5	69	78.2	29	47.8
29	El Dorado	442	55.7	433	50.7	41	83.6	16	40.2
30	Imperial	405	49.1	387	44.7	65	68.3	34	49.0
31	Napa	414	55.7	405	50.1	34	51.8	21	49.6
32	Kings	425	47.9	401	41.1	81	69.4	30	23.6
33	Madera	428	52.8	410	46.5	72	68.3	31	37.3
34	Monterey	396	51.0	384	45.2	54	67.1	22	43.6
35	Humboldt	400	67.5	394	63.4	42	73.1	22	49.7
36	Nevada	434	58.1	423	52.4	36	76.1	19	42.3
37	Mendocino	428	59.1	418	52.8	39	86.8	15	51.1
38	Sutter	414	49.9	399	42.8	46	71.2	18	37.0
39	Yuba	412	53.5	398	48.1	56	80.9	27	42.5
40	Lake	399	57.8	394	53.4	27	74.6	11	32.1
41	San Benito	416	48.7	403	42.9	56	87.7	24	47.5
42	Colusa, Glenn, Tehama	324	50.2	318	46.4	34	67.5	17	43.8

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) (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	659	61.9	641	54.7	59	84.9	17	49.1
44	Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, Tuolumne	998	61.3	974	55.4	87	79.8	35	44.3

Table 6-4 shows the household, adult, child, and adolescent extended interview response rate for the cell phone sample. There were 7,752 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. Within stratum, there was a wide range of rates, with a low of 47.2 percent in Imperial to a high of 66.6 percent in San Luis Obispo. Although the number of cases used to compute the household response rate is the same as the number of adult cases for the adult response rate in Table 6-4, the adult and household response rates are computed using different weights as described in Chapter 5. The adult response rate is computed using the adult base weight and reflects the probability of selection of the adult within the household. In the cell phone sample, this probability of selection depends on the number of adults who share the cell phone. As shown in Table 6-4, the adult response rate is lower than the household response rate because adults in household who share their cell have a lower response rate than adults in household who do not share their cell phone (i.e., there are more nonrespondents with larger weights).

Additionally, 7,752 adult interviews, 1,256 interviews about children, and 482 adolescent interviews were completed in the cell phone sample. The statewide response rate for the adult interview was 52.1 percent. This represents a decrease of 1.7 percentage points from CHIS 2013-2014. The cell phone child interview response rate was 72.2 percent, which is 1.2 points lower than the equivalent response rate observed CHIS 2013-2014. The cell phone sample adolescent response rate was 41.0 percent, which is 1.6 percentage points lower than the response rate observed in CHIS 2013-2014.

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

	Stratum	Household		Adult		Child		Adolescent	
		Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
	State total	7,752	53.9	7,752	52.1	1,256	72.2	482	41.0
1	Los Angeles	1,448	51.6	1,448	49.7	230	70.5	80	39.6
2	San Diego	846	54.7	846	53.2	155	77.5	48	38.0
3	Orange	420	52.2	420	50.8	70	64.5	25	34.5
4	Santa Clara	281	54.3	281	53.2	44	71.6	17	46.7
5	San Bernardino	245	53.1	245	53.1	38	67.8	11	30.2
6	Riverside	235	55.9	235	52.6	39	72.6	21	56.4
7	Alameda	257	56.3	257	54.7	29	71.2	14	36.1
8	Sacramento	216	56.9	216	54.1	30	66.6	12	43.3
9	Contra Costa	111	55.3	111	55.0	20	88.8	4	23.4
10	Fresno	120	52.9	120	50.8	24	84.1	6	36.6
11	San Francisco	195	57.7	195	54.2	32	80.4	11	52.3
12	Ventura	115	48.1	115	45.8	17	65.0	6	38.6
13	San Mateo	93	55.6	93	50.6	13	46.8	5	22.3
14	Kern	99	55.0	99	53.6	18	88.8	12	62.5
15	San Joaquin	95	51.5	95	49.1	12	66.5	8	77.4
16	Sonoma	90	55.5	90	54.0	12	73.2	7	29.7
17	Stanislaus	87	48.2	87	50.0	14	54.1	3	4.4
18	Santa Barbara	92	60.6	92	59.1	12	82.5	12	67.6
19	Solano	96	55.3	96	55.0	18	88.2	8	54.2
20	Tulare	97	52.9	97	50.5	16	84.1	11	51.6
21	Santa Cruz	109	57.7	109	55.8	14	82.7	2	14.6
22	Marin	103	63.4	103	59.4	19	87.1	3	34.2
23	San Luis Obispo	89	66.6	89	61.7	15	82.0	4	44.6
24	Placer	91	62.2	91	61.6	16	75.5	9	61.4
25	Merced	111	54.3	111	52.3	25	80.5	14	54.9
26	Butte	91	60.5	91	55.9	16	85.5	5	49.5
27	Shasta	108	61.6	108	58.3	17	82.1	8	50.1
28	Yolo	118	62.4	118	63.1	20	85.0	2	18.2
29	El Dorado	102	62.1	102	59.2	7	44.0	6	47.1
30	Imperial	135	47.2	135	45.0	26	74.0	14	53.4
31	Napa	125	54.9	125	52.3	18	66.7	7	38.4
32	Kings	113	55.5	113	52.4	22	70.2	12	56.2
33	Madera	120	47.8	120	45.3	32	89.0	8	56.9
34	Monterey	89	51.1	89	50.1	21	68.6	9	57.0
35	Humboldt	97	60.3	97	60.1	13	84.8	5	31.8
36	Nevada	88	57.1	88	57.5	14	82.2	6	65.1
37	Mendocino	134	53.9	134	52.8	8	58.5	9	66.1
38	Sutter	262	50.7	262	47.8	40	75.1	15	39.7
40	Lake	94	62.1	94	60.1	17	87.2	4	19.5
41	San Benito	126	60.5	126	59.5	23	64.7	7	46.8
42	Colusa, Glenn, Tehama	71	60.7	71	59.3	12	53.1	4	19.2

Table 6-4. Number of completed extended interviews and extended interview response rate by cell phone sampling stratum for the cell phone 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	68	66.5	68	67.5	9	72.9	4	82.9
44	Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, Tuolumne	70	51.8	70	52.3	9	81.8	4	54.9

Source: UCLA Center for Health Policy Research, 2013-2014 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 7.3 percentage points 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 7.3 points higher than the cell rate if the screener respondent is sampled, and about 12 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 68 percent of landline/list households, compared with 98 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.

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 2013-2014. In contrast, this gender response gap is smaller in the cell sample (5.1 percent vs. 10 percent). Men also respond at a higher rate (49.5 percent) in the cell sample than in the landline/list sample (39.4 percent).

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[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.

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

Characteristic	Sample type response rate (%)	
	Landline/List	Cell phone
Total	44.8	52.1
Sex		
Male	39.4	49.5
Female	49.7	54.6
Age		
18 to 30 years	30.0	51.0
31 to 45 years	37.3	49.3
46 to 65 years	46.6	54.3
Over 65 years	54.9	54.1
Type of household		
With somebody less than 18 years old	37.8	48.1
Without somebody less than 18 years old	48.7	55.2
Number of adults in household		
1	65.5	53.6
2	48.4	54.5
3 or more	34.7	48.5
Sampled adult was screener respondent		
Yes	62.5	55.1
No	28.1	16.4

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

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 25 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 3.2 percentage points. In the landline/list sample, those 18-30 comprise 14 percent of sampled adults, as compared with 26 percent for the cell sample.

Across CHIS cycles, response among households with children is declining faster than among those without (see *CHIS 2013-2014 Methodology Series: Report 2 – Data Collection Methods*). In the landline and list samples, there is an almost 11 point difference in response rate between adults in households with children and those in other households. This difference is 7.1 points in the cell phone sample, which is much larger than the 2.8 point difference in response rate observed in CHIS 2011-2012. Thirty-five percent of adults in the landline/list households lived with a child under 18, as compared with 44 percent of adults in the cell phone sample.

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.

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 68.9 percent for the landline/surname sample, which is 3.6 points lower than that in CHIS 2011-2012. The median rate in the more populous counties (69.2 %) is 3.1 points lower than the rate in smaller counties (73.1%). The statewide child-level response for the cell phone sample is 72.2 percent, which is 3.3 points larger than the response rate in the combined landline and surname samples, and 1.2 points lower than the rate for the cell phone child sample in CHIS 2011-2012.

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 in both the landline/list or cell phone samples. However, there are some differences in the response rate for two younger child groups (less than 4 years and 4 to 7 years old) where the cell phone sample response rate is higher than the response landline response rate. In contrast, this pattern is reversed for older children. *CHIS 2013-2014 Methodology Series: Report 2 – Data Collection Methods* contains more detail on response to the child interview.

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. 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 landline adolescent response rate is 40.4 percent. If we exclude nonresponse due to parents not giving permission, the landline cooperation rate rises 74.6 percent. Similarly, the state-level adolescent response rate in the cell phone sample is 41.0 percent while the cell phone adolescent cooperation is 69.7 percent if the nonresponse due to parents not giving permission is excluded.

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

Characteristic	Sample type response rate (%)	
	Landline/List	Cell phone
Total	68.9	72.2
Sex		
Male	68.7	72.5
Female	68.9	71.8
Age		
Less than 4 years	68.1	73.9
4 to 7 years	68.9	73.3
8 to 11 years	72.0	69.9
Number of children in household		
1	68.9	73.8
2	73.0	72.3
3	63.3	72.4
4 or more	68.9	66.1

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

Table 6-7 gives the landline and cell phone adolescent response rates by the characteristics of the adolescent and household based on data collected in the adult interview or screener. These rates have some small variation across sex, age, and the number of adolescents in the household. There is also some 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 5 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.

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 Table 6-8 were taken into account in developing the weights as described in *CHIS 2013-2014 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.

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	40.4	41.0
Sex		
Male	37.8	45.2
Female	40.2	36.9
Age		
12 to 14 years	33.4	37.4
15 to 17 years	40.2	44.2
Number of adolescents in household		
1	40.4	41.0
2	40.2	37.7
3 or more	30.7	53.8

Source: UCLA Center for Health Policy Research, 2013-2014 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	74.6	69.7
Sex		
Male	73.9	73.2
Female	76.9	65.8
Age		
12 to 14 years	73.9	65.9
15 to 17 years	72.3	72.9
Number of adolescents in household		
1	73.9	69.6
2	67.2	68.0
3 or more	74.7	74.9

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

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 2013-2014. 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_5._Response_Rate, 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 landline/list adult response rate is 2.7 percentage points lower than the overall landline/list adult response rate in CHIS 2011.

Table 6-10 shows the overall response rate for the cell phone sample. The lowest adult response rate was in Imperial County (12.9 percent) while the highest was in Santa Barbara County (22.9 percent). The overall adult response rate was 16.0 percent, which is about 3 percentage points higher than the overall 12.9 percent rate that was observed for adults in the landline/list sample.

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

	Stratum	Interview type overall response rate(%)			
		Household	Adult	Child	Adolescent
	State total	14.8	12.9	11.0	5.3
1	Los Angeles	13.7	11.8	10.2	5.4
2	San Diego	14.3	12.6	11.1	5.1
3	Orange	11.8	10.1	8.1	4.0
4	Santa Clara	13.8	12.1	10.2	4.8
5	San Bernardino	14.4	12.5	11.3	5.4
6	Riverside	14.3	12.4	9.5	5.9
7	Alameda	15.3	13.4	12.7	5.5
8	Sacramento	16.0	13.8	11.1	5.8
9	Contra Costa	13.8	12.2	10.4	4.4
10	Fresno	15.5	13.6	11.7	6.6
11	San Francisco	13.0	11.5	10.4	5.1
12	Ventura	14.9	12.8	12.1	2.7
13	San Mateo	13.0	11.2	9.2	3.1
14	Kern	18.8	17.2	14.5	7.7
15	San Joaquin	16.3	14.5	12.3	5.1
16	Sonoma	18.1	16.1	12.8	6.6
17	Stanislaus	15.5	13.9	10.1	5.3
18	Santa Barbara	16.2	14.4	12.6	4.6
19	Solano	13.9	12.6	8.6	5.6
20	Tulare	19.1	15.8	14.6	5.8
21	Santa Cruz	17.9	15.4	12.9	5.4
22	Marin	17.0	15.6	13.6	7.1
23	San Luis Obispo	20.5	18.5	15.8	5.5
24	Placer	16.4	15.1	15.4	7.2
25	Merced	15.9	13.9	11.9	7.6
26	Butte	23.6	22.0	21.9	13.2
27	Shasta	24.4	22.1	19.3	9.6
28	Yolo	20.2	16.8	19.1	9.7
29	El Dorado	17.5	16.0	16.2	6.2
30	Imperial	18.7	17.0	14.4	8.3
31	Napa	15.8	14.2	8.2	7.6
32	Kings	14.6	12.5	11.0	4.1
33	Madera	17.6	15.5	14.2	6.0
34	Monterey	15.9	14.1	10.9	6.4
35	Humboldt	27.4	25.7	20.6	11.7
36	Nevada	18.5	16.6	16.0	7.8
37	Mendocino	23.6	21.1	20.0	9.1
38	Sutter	16.0	13.7	11.4	5.4
39	Yuba	17.7	15.9	13.9	6.5
40	Lake	22.4	20.7	16.9	5.7
41	San Benito	12.7	11.2	10.5	4.8
42	Colusa, Glenn, Tehama	20.0	18.5	11.2	7.3
43	Del Norte, etc.	23.5	20.8	22.5	9.2
44	Alpine, etc.	21.1	19.1	16.3	9.2

* 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, 2013-2014 California Health Interview Survey.

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

	Stratum	Interview type overall response rate (%)			
		Household	Adult	Child	Adolescent
	State total	16.6	16.0	11.5	6.6
1	Los Angeles	16.8	16.2	11.4	6.4
2	San Diego	16.3	15.9	12.3	6.0
3	Orange	15.2	14.8	9.5	5.1
4	Santa Clara	14.6	14.3	10.2	6.7
5	San Bernardino	16.4	16.4	11.1	5.0
6	Riverside	18.3	17.2	12.5	9.7
7	Alameda	14.7	14.3	10.2	5.2
8	Sacramento	17.5	16.6	11.1	7.2
9	Contra Costa	15.4	15.3	13.6	3.6
10	Fresno	18.9	18.2	15.3	6.7
11	San Francisco	14.8	13.9	11.2	7.3
12	Ventura	15.2	14.5	9.4	5.6
13	San Mateo	15.2	13.9	6.5	3.1
14	Kern	20.1	19.6	17.4	12.2
15	San Joaquin	15.1	14.4	9.6	11.2
16	Sonoma	15.3	14.9	10.9	4.4
17	Stanislaus	15.1	15.7	8.5	0.7
18	Santa Barbara	22.9	22.3	18.4	15.1
19	Solano	16.0	15.9	14.0	8.6
20	Tulare	19.1	18.2	15.3	9.4
21	Santa Cruz	18.8	18.2	15.0	2.7
22	Marin	17.3	16.3	14.2	5.6
23	San Luis Obispo	20.5	19.0	15.6	8.5
24	Placer	19.4	19.2	14.5	11.8
25	Merced	18.2	17.6	14.1	9.7
26	Butte	20.6	19.0	16.2	9.4
27	Shasta	16.0	15.2	12.5	7.6
28	Yolo	17.3	17.5	14.9	3.2
29	El Dorado	17.5	16.7	7.3	7.9
30	Imperial	13.5	12.9	9.5	6.9
31	Napa	16.1	15.4	10.3	5.9
32	Kings	18.7	17.6	12.4	9.9
33	Madera	15.5	14.7	13.1	8.3
34	Monterey	17.9	17.5	12.0	10.0
35	Humboldt	20.2	20.1	17.1	6.4
36	Nevada	15.8	15.9	13.1	10.3
37	Mendocino	17.2	16.9	9.9	11.2
38	Sutter	14.8	14.0	10.5	5.6
40	Lake	20.1	19.5	17.0	3.8
41	San Benito	17.8	17.5	11.3	8.2
42	Colusa, Glenn, Tehama	21.6	21.1	11.2	4.0
43	Del Norte, etc.	21.3	21.6	15.7	17.9
44	Alpine, etc.	14.5	14.6	11.9	8.0

* 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, 2013-2014 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. The overall response rates are lower than the rate observed in CHIS 2011-2012 and it follows the trends of response rates in telephone surveys in the U.S.

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

Sample type	Overall response rate (%)			
	Household	Adult	Child	Adolescent*
Landline/list	14.8	12.9	11.0	5.3
Cell phone	16.6	16.0	11.5	6.6
Landline/list//cell-phone	16.0	15.0	11.4	6.1

* Includes parent permission

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

7. DISCUSSION OF RESPONSE RATES

In this chapter, we discuss the response rates from CHIS 2013-2014 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 2013-2014 that effect response rates, mentioned in Chapter 4. A more complete discussion of these methods is provided in *CHIS 2013-2014 Methodology Series: Report 2 – Data Collection Methods*. The response rates obtained in CHIS 2013-2014 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), *CHIS 2009 Methodology Series: Report 4 – Response Rates* (California Health Interview Survey, 2011) and *CHIS 2011-2012 Methodology Series: Report 4 – Response Rates* (California Health Interview Survey, 2014) contain 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 seven 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 2013-2014 Methodology Series: Report 2 – Data Collection Methods*. We summarize them here to provide some context for the CHIS 2013-2014 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 2013-2014 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 2013-2014, the data summarized in Table 7-1 showing higher response rates by whether an advance letter was mailed are consistent with previous CHIS cycles and experiments from other studies.

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

| | Response rate (%) | | |
| | Advance letter mailed | | |
Type	Yes	No	Difference (%)
Screener	33.2	20.1	+13.1
Adult interview	48.2	38.1	+10.1
Child interview	72.0	64.9	+7.1
Adolescent interview	44.5	33.4	+11.1
Household extended	54.9	44.4	+10.5

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

Other methods for enhancing response rates in CHIS 2013-2014 include:

- Repeated Call Attempts: The procedures implemented in CHIS 2013-2014 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. In previous cycles proxy interviews were permitted for all adults in who were over

65 and unable to participate because of mental or physical disabilities, in CHIS 2013-2014, there were no age restrictions. A total of 271 adult proxy interviews were done. 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, Vietnamese, and Tagalog. In many cases, households that did not speak English would not have been included in CHIS had it not been for the additional languages. In some cases, the respondents would have tried to respond in English but the quality of the interviews would have been much lower if the other languages were not provided. The translation of the instruments provides a common basis for the interviewers that would not be available otherwise. Table 7-2 gives the number of interviews that were completed by language. More than 11,600 households completed the screener using a language other than English, accounting for about 15 percent of all the completed screener interviews in CHIS 2013-2014. Spanish is the most frequently used language, with 80 percent of the non-English screener interviews being completed in Spanish. Korean 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.

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

Interview type/ Sample type	English	Non-English							Total
		Spanish	Vietnamese	Korean	Cantonese	Mandarin	Tagalog	Total	
Screener interviews									
Total	65,661	9,371	646	569	458	539	62	11,645	77,306
Landline	53,286	7,316	391	341	412	478	51	8,989	62,275
Cell phone sample	11,963	2,055	59	72	44	60	11	2,301	14,264
Korean only**	47	0	2	124	0	0	0	126	173
Korean and other**	19	0	1	32	0	0	0	33	52
Vietnamese only**	49	0	193	0	2	1	0	196	245
Japanese first name**	137	0	0	0	0	0	0	0	137
Japanese last name**	37	0	0	0	0	0	0	0	37
Japanese both names**	123	0	0	0	0	0	0	0	123
Adult interviews									
Total	35,265	3,301	402	303	185	275	28	4,494	39,759
Landline	28,159	2,578	264	184	163	243	24	3,456	31,615
Cell phone sample	6,893	723	36	43	22	31	4	859	7,752
Korean only**	22	0	2	62	0	0	0	64	86
Korean and other**	10	0	1	14	0	0	0	15	25
Vietnamese only**	19	0	99	0	0	1	0	100	119
Japanese first name**	70	0	0	0	0	0	0	0	70
Japanese last name**	19	0	0	0	0	0	0	0	19
Japanese both names**	73	0	0	0	0	0	0	0	73
Child interviews									
Total	4,228	1,119	53	23	24	22	1	1,242	5,470
Landline	3,154	926	35	10	21	17	1	1,010	4,164
Cell phone sample	1,044	193	5	6	3	5	0	212	1,256
Korean only**	7	0	0	6	0	0	0	6	13
Korean and other**	3	0	0	1	0	0	0	1	4
Vietnamese only**	2	0	13	0	0	0	0	13	15
Japanese first name**	11	0	0	0	0	0	0	0	11
Japanese last name**	5	0	0	0	0	0	0	0	5
Japanese both names**	2	0	0	0	0	0	0	0	2

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

Interview type/ Sample type	English	Non-English							Total
		Spanish	Vietnamese	Korean	Cantonese	Mandarin	Tagalog	Total	
Parent Permission interviews									
Total	2,241	736	33	12	8	8	1	798	3,039
Cell phone sample	1,693	594	18	8	7	6	1	634	2,327
Landline	536	142	5	2	1	2	0	152	688
Korean only**	1	0	0	2	0	0	0	2	3
Korean and other**	1	0	0	0	0	0	0	0	1
Vietnamese only**	1	0	10	0	0	0	0	10	11
Japanese first name**	5	0	0	0	0	0	0	0	5
Japanese last name**	2	0	0	0	0	0	0	0	2
Japanese both names**	2	0	0	0	0	0	0	0	2
Adolescent interviews									
Total	2,136	92	4	3	0	3	0	102	2,238
Landline	1,655	78	2	1	0	2	0	83	1,738
Cell phone sample	466	14	0	1	0	1	0	16	482
Korean only**	2	0	0	1	0	0	0	1	3
Korean and other**	0	0	0	0	0	0	0	0	0
Vietnamese only**	7	0	2	0	0	0	0	2	9
Japanese first name**	2	0	0	0	0	0	0	0	2
Japanese last name**	2	0	0	0	0	0	0	0	2
Japanese both names**	2	0	0	0	0	0	0	0	2

* In 2013-2014 there were 8 types of samples 1) Landline, 2) Cell phone, 3) Korean surname list, 4) Korean and other list , 5) Vietnamese list, 5) Japanese first name list, 5) Japanese last name list , and 6) Japanese both names list. See *CHIS 2013-2014 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. Japanese first name refers to the supplemental sample from a frame with Japanese first names and not other ethnic groups. Japanese last name refers to the supplemental sample from a frame with Japanese last names and not other ethnic groups. Japanese both names refers to the supplemental sample from a frame with Japanese both first and last names and not other ethnic groups

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

7.2 Comparisons of Response Rates Over the Cycles

While the sampling and content varies somewhat across CHIS cycles, 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 2013-2014 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 same information is presented graphically in Figure 7-1 and Figure 7-2. 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 2.8 points or about 9 percent, between 2011-2012 and 2013-2014 in the landline/list sample, and 2.3 points or about 7 percent in the cell phone 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 landline adult response rate has been about 5.7 percent, with the largest decrease (almost 10 percent) between 2005 and 2007. The mean decline in the conditional cell phone adult response rate has been 3.8 percent.

Table 7-3.   Comparison of state-level response rates for the landline/list sample from CHIS 2001 to 2013-2014

	CHIS cycle response rate (%)						
Type	2001	2003	2005	2007	2009	2011-2012	2013-2014
Landline/list sample							
Screener Interview	59.2	55.9	49.8	35.6	36.1	31.6	28.8
Extended Interview							
Household[1]	-	-	59.3	59.4	54.7	53.9	51.4
Adult	63.7	59.9	54.0	52.8	49.0	47.4	44.8
Child	87.6	81.4	75.2	73.7	72.9	73.2	68.9
Adolescent	63.5	57.3	48.5	44.1	42.8	42.7	40.2
Adolescent w/ parental permission[2]	84.5	83.3	77.5	74.7	75.1	74.0	73.9
Overall landline/list[3]							
Household	-	-	29.6	21.1	19.7	17.0	14.8
Adult	37.7	33.5	26.9	18.7	17.7	15.0	12.9
Child	33.0	27.3	25.2	16.8	15.7	13.8	11.0
Adolescent	23.9	19.2	14.2	10.2	7.9	6.7	5.3
Cell phone sample[4]							
Screener Interview	-	-	-	-	19.3	33.0	30.7
Extended Interview	-	-	-	-			
Household[1]	-	-	-	-	57.6	55.5	53.9
Adult	-	-	-	-	56.2	53.8	52.1
Child	-	-	-	-	76.0	73.4	72.2
Adolescent	-	-	-	-	46.4	42.6	41.0
Adolescent w/ parental permission[2]	-	-	-	-	75.6	69.9	69.7
Overall cell phone	-	-	-	-			
Household	-	-	-	-	11.1	18.3	16.6
Adult	-	-	-	-	10.8	17.8	16.0
Child	-	-	-	-	8.2	13.0	11.5
Adolescent	-	-	-	-	5.0	7.6	6.6
Combined landline/list and cell phone sample[4]							
Household	-	-	-	-	17.4	17.7	16.0
Adult	-	-	-	-	15.6	16.5	15.0
Child	-	-	-	-	14.1	13.3	11.4
Adolescent	-	-	-	-	7.5	7.1	6.1

[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, 2013-2014 California Health Interview Survey.

Figure 7-1.   CHIS Overall response rates by sample type(landline LL and cell phone CP) and type of interview (adult, child, and adolescent)
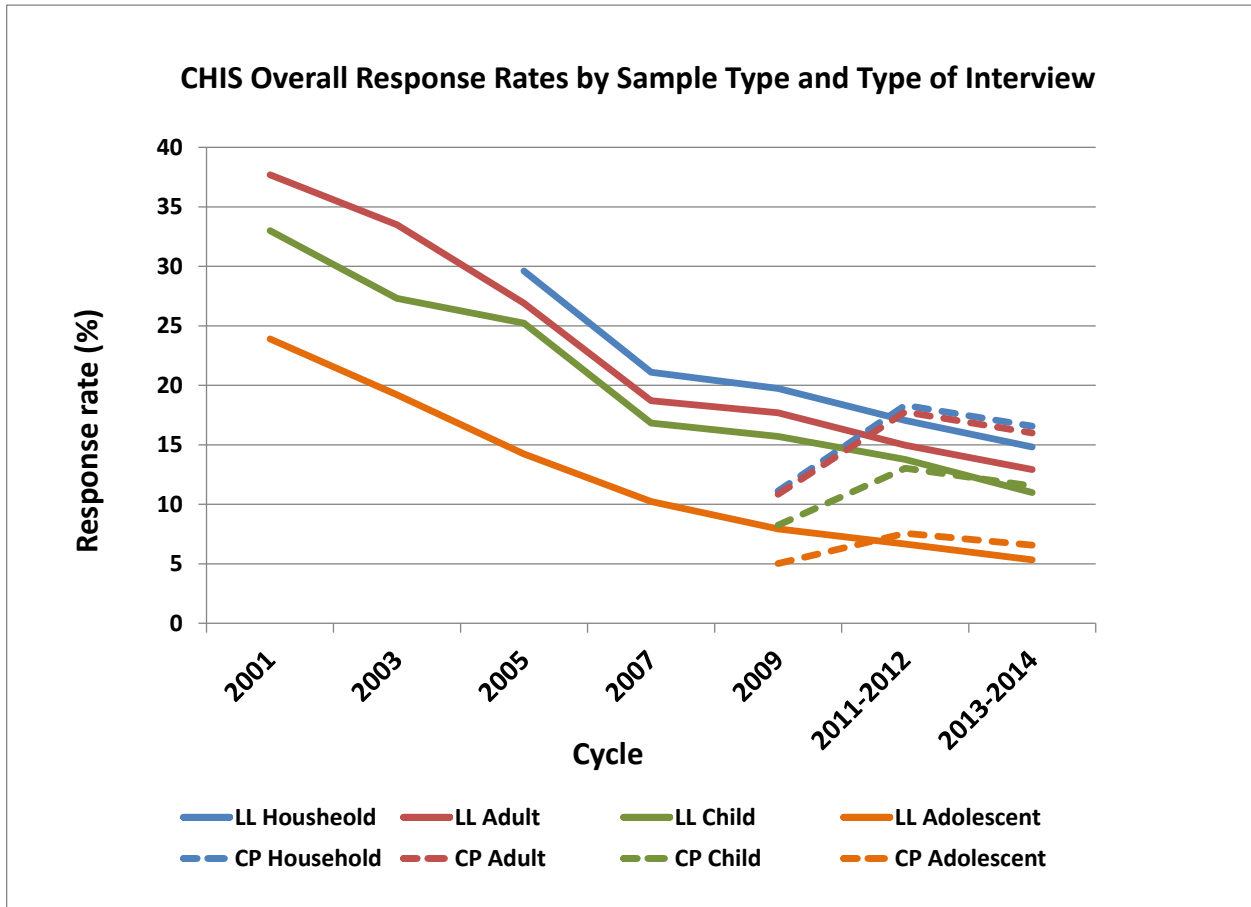
CHIS Overall Response Rates by Sample Type and Type of Interview

Source: UCLA Center for Health Policy Research, 2013-2014 California Health Interview Survey.

Figure 7-2. CHIS Overall response rates by type of interview (adult, child, and adolescent)
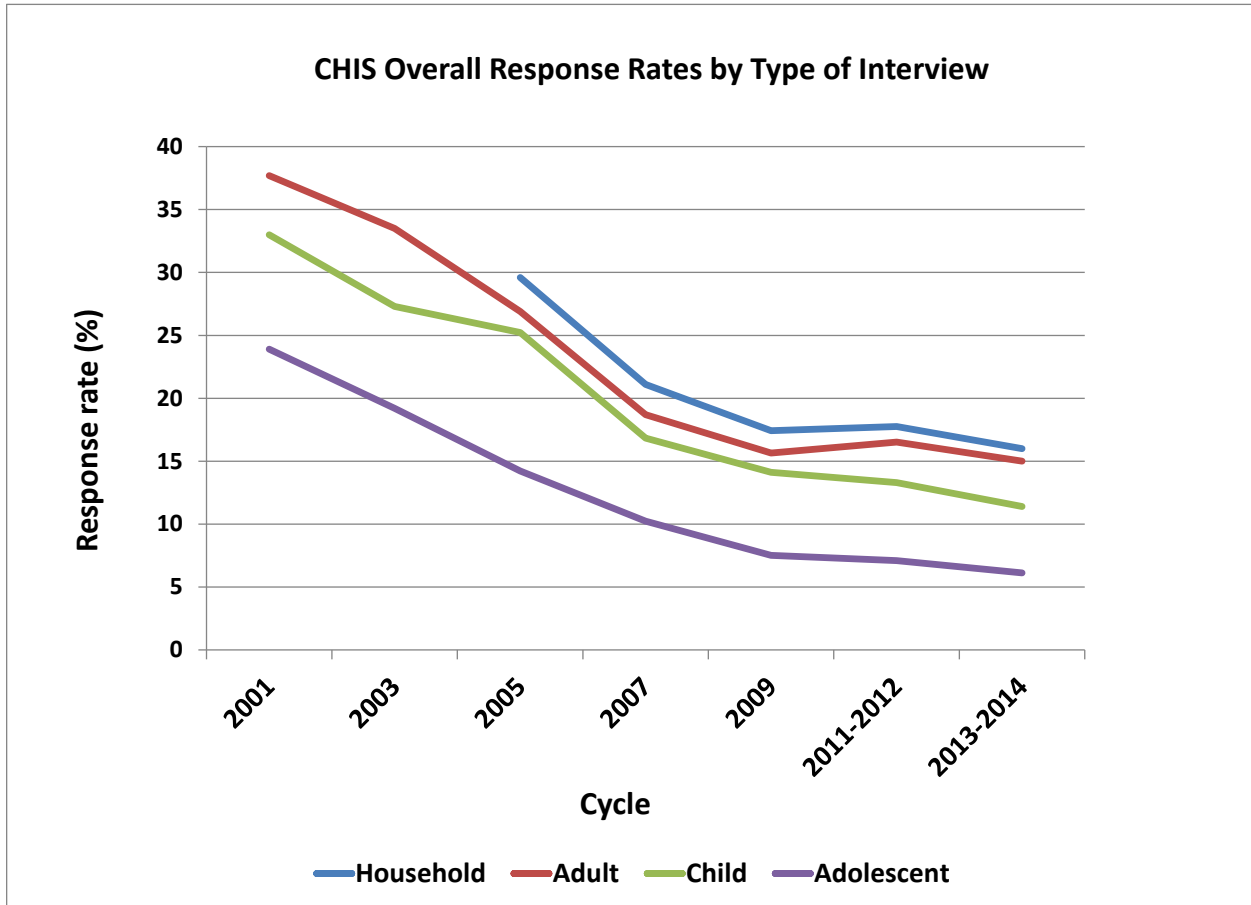
CHIS Overall Response Rates by Type of Interview

Appendix A provides tables showing the rates for each stratum from 2001 to 2013-2014 for the landline and list samples by sampling stratum.

7.3 Comparisons of Response Rates with Other Telephone Surveys

In this section we compare the response rates from CHIS 2013-2014 to those from other telephone surveys of the adult population in California. These comparisons are not direct because other surveys may differ in sampling methods, the types of persons selected for 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 telephone 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, 2015)

are attempts to address this problem. This section includes only RDD surveys conducted in California between 2013 and 2014. Earlier reports covered those conducted prior to 2013.

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 2013 BRFSS and its data quality report with response rates is available from the CDC web site (http://www.cdc.gov/brfss/annual_data/2013/pdf/2013_dqr.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 2013-2014 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 2013 BRFSS Summary Data Quality Report with Response Rates (Centers for Disease Control, 2014) includes information about its response rates. The report shows disposition codes that follow the spirit of the AAPOR recommendations. Despite the detail given, it is very difficult to map the 2013 California BRFSS disposition codes unambiguously to the corresponding disposition codes used in CHIS 2013-2014 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.

The 2013 BRFSS Summary Data Quality Report includes AAPOR Response rate 4 for the landline, cell phone and combined samples, in Table 6. This rate that is closest to the definition used in CHIS is the overall response rate. However, for 2013 California BRFSS, the overall response rate is 39.0 percent. This response rate is 24.2 points higher than the CHIS 2013-2014 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 (BRFSS disposition codes 1100 and 1200), (2) nonresponse, (BRFSS disposition codes 2111 to 2330) (3) residential status not determined, (BRFSS disposition codes 3100 to 3700), and (4) ineligible (BRFSS disposition codes 4100 to 4900). Although the BRFSS codes and their mapping to these categories largely match the CHIS disposition codes, in some cases there is not enough information to classify some cases as nonresponse and those classified as "residential status not determined" using the BRFSS information.

Despite these limitations of mapping the CHIS 2013-2014 disposition codes to the BRFSS definitions and methodology we computed the equivalent to the BRFSS AAPOR RR4 response rates as shown in Table 7-4. 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 landline CHIS 2013-2014 response rate is 1.6 percentage points higher than the 2013 BRFSS landline response rate. In contrast, the CHIS 2013-2014 cell phone rate is 11.5 percentage points lower than the 2013 BRFSS cell phone rate. However, the combined landline/cell CHIS 2013-2014 response rate is only 1.8 percentage points lower than the 2013 BRFSS combined response rate. The combined response rate in the table was computed using the same landline and cell phone factors as those used in the 2013 BRFSS. If we compute these factors using the CHIS factors for combining the landline and cell phone sample, the combined response rate is 34.1 percent. It is important to highlight the large increase in the CA BRFSS cell phone sample response rate between 2011 (20.4 percent) and 2013 (39.3 percent). We could not find any explanation for this anomalous increase.

Table 7-4.   2013 CA BRFSS and CHIS 2013-2014 unconditional response rates using the BRFSS definitions

Sample	Survey response rate (%)	
	BRFSS- 2013	CHIS 2013-2014
Landline	38.9	40.5
Cell phone	39.3	27.8
Combined landline and cell phone	39.0	37.2*

* Combined rate computed using the same BRSFF 2013 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. The 2013 report does not distinguish between partial and full interviews. The last BRFSS report that we are aware of that did so for California was in 2007, when 11 percent of BRFSS completed interviews were partial; CHIS cycles have maintained a fairly consistent rate of about 0.5 percent partial interviews. If this difference were taken into account, then the CHIS response rates would likely be much higher (or the BRFSS rates much lower) than those shown in Table 7-4.

REFERENCES

Brick, J. M. (2013). Unit Nonresponse and Weighting Adjustments: A Critical Review. *Journal of Official Statistics, 29*, pp. 329-353.

Brick, J., & Jones, M. (2008). Propensity to Respond and Nonresponse Bias. *Metron-International Journal of Statistics, LXVI*, 51-73.

California Health Interview Survey. (2002). CHIS 2001: Methodology Series: Report 4 – Response Rates. Los Angeles, CA. Retrieved September 18, 2013, from http://healthpolicy.ucla.edu/chis/design/Pages/methodology.asp

California Health Interview Survey. (2005). CHIS 2003 Methodology Series: Report 4 – Response Rates. Los Angeles, CA. Retrieved September 18, 2013, from http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx

California Health Interview Survey. (2007). CHIS 2005: Methodology Series: Report 4 – Response Rates. Los Angeles, CA. Retrieved from http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx

California Health Interview Survey. (2009). CHIS 2007: Methodology Series: Report 4 – Response Rates. Los Angeles, CA. Retrieved September 18, 2013, from http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx

California Health Interview Survey. (2011). CHIS 2009: Methodology Series: Report 4 – Response Rates. Los Angeles, CA. Retrieved September 18, 2013, from http://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx

California Health Interview Survey. (2014). *CHIS 2011-2012 Methodology Series: Report 4 - Response Rates.* Los Angeles, CA.

Centers for Disease Control. (2014). *Behavioral Risk Factor Surveillance System: 2013 Summary Data Quality Report*. Retrieved May 22, 2015, from (http://www.cdc.gov/brfss/annual_data/2013/pdf/2013_dqr.pdf

Council of American Survey Research Organizations. (1982). *Special Report: On the Definition of Response Rates.* Post Jefferson, NY: CASRO.

Curtin, R., Presser, S., & Singer, E. (2000). The Effects of Response Rates Changes on The Index of Consumer Sentiment. *Public Opinion Quarterly, 64*, 413-428.

Curtin, R., Presser, S., & Singer, E. (2003). Recent response rate changes on the Michigan Survey of Consumer Attitudes. *Paper presented at 2003 AAPOR meetings.*

Groves, R. (2006). Rates and Nonresponse Bias in Household Surveys. *70*, pp. 646-675.

Keeter, S., Miller, C., Kohut, A., Groves, R., & Presser, S. (2000). Consequences of Reducing Nonresponse in A National Telephone Survey. *Public Opinion Quarterly, 64*, pp. 125-148.

Lee, S., Nguyen, H., Jawad, M., & Kurata, J. (2008). Linguistic Minorities and Nonresponse Error. Public Opinion Quarterly, 72,. *72*, 470-486.

Lessler, J., & Kalsbeek, W. (1992). *Nonsampling errors in surveys.* New York: John Wiley and Sons.

Madow, W., Nisselson, H., & Olkin, I. (1983). *Madow, W., Nisselson, H., and Olkin, I. (Incomplete Data on Sample Surveys, Volume 1 – Report and Case Studies.* Academic Press.

McCarty, C. (2003). Differences in response rates using most recent versus final dispositions in telephone surveys. *Public Opinion Quarterly, 67*, 396-406.

Rizzo, L., Brick, J., & Park, I. (2004). A Minimally Intrusive Method for Sampling Persons in Random Digit Dialing Surveys. *Public Opinion Quarterly, 68*, 267-274.

Särndal, C., & Lundström, S. (2005). *Estimation in Surveys with Nonresponse.* Chichester, England: John Wiley & Sons.

Särndal, C.-E. (2011). Three Factors to Signal Non-Response Bias with Applications to Categorical Auxiliary Variables. *International Statistical Review, 79*, 233-254.

Schouten, B., Cobben, F., & Bethlehem, J. (2009). Indicators for the Representativeness of Survey Response. *Survey Methodology, 35*, 101-113.

Shapiro, G., Battaglia, M., Massey, J., & Tompkins, L. (1995). Calling Local telephone Company Business Offices to Determine the Residential Status of a Wide Class of Unresolved Telephone Numbers in a Random-Digit-Dialing Sample. *Proceedings of the Survey Research Methods Section of the American Statistical Association*, (pp. 975-98).

The American Association for Public Opinion Research. (2015). *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 7th edition* (8th ed.). AAPOR.

APPENDIX A

Table A-1. Screener response rates for the landline/list sample by sampling stratum from CHIS 2001 to CHIS 2013-2014

Stratum	Description	Cycle						
		2001	2003	2005	2007	2009	2011-2012	2013-2014
	State total	59.2	55.9	49.8	35.5	36.1	31.6	28.8
1	Los Angeles	56.9	51.0	46.6	31.5	34.9	29.2	28.6
2	San Diego	59.9	56.8	48.1	34.7	35.5	31.3	28.4
3	Orange	59.0	54.2	46.8	32.5	36.6	28.7	24.8
4	Santa Clara	57.1	57.1	45.7	35.1	32.0	29.4	25.5
5	San Bernardino	63.7	61.0	53.7	37.9	37.4	33.0	29.7
6	Riverside	62.2	59.1	52.7	37.1	35.5	33.1	29.0
7	Alameda	57.6	54.9	49.4	36.2	36.6	29.4	27.0
8	Sacramento	61.3	60.3	53.0	38.0	36.4	32.4	29.5
9	Contra Costa	57.6	58.8	51.5	36.4	35.9	30.2	26.4
10	Fresno	64.0	59.5	57.2	36.3	36.3	32.6	31.5
11	San Francisco	50.7	44.2	43.1	26.3	27.4	25.2	22.7
12	Ventura	59.4	57.1	52.4	39.2	35.5	34.6	30.0
13	San Mateo	53.8	54.6	45.6	31.1	32.6	28.1	23.5
14	Kern	68.9	62.9	55.3	44.0	40.5	37.6	35.9
15	San Joaquin	64.7	58.1	55.7	36.8	36.4	34.3	30.8
16	Sonoma	61.3	56.6	52.4	38.8	37.9	34.7	30.5
17	Stanislaus	65.7	61.0	56.5	39.9	38.7	34.4	30.1
18	Santa Barbara	62.1	61.0	52.1	48.1	36.9	36.4	31.5
19	Solano	61.5	61.9	51.8	36.8	32.3	30.2	27.2
20	Tulare	67.7	66.2	57.5	41.5	41.5	41.2	35.8
21	Santa Cruz	57.7	57.7	55.4	39.6	40.7	36.3	32.3
22	Marin	54.7	54.5	49.0	38.7	37.8	29.6	28.2
23	San Luis Obispo	61.6	64.4	56.3	50.6	42.4	38.0	36.2
24	Placer	60.3	60.9	52.5	42.1	37.7	35.5	31.4
25	Merced	66.2	61.4	55.1	40.0	39.6	33.4	33.1
26	Butte	67.3	63.8	60.3	44.9	45.9	40.0	39.3
27	Shasta	65.7	63.2	61.8	50.1	44.1	41.4	39.7
28	Yolo	66.2	64.4	56.2	44.0	36.9	36.0	33.2
29	El Dorado	57.8	59.4	54.3	41.0	35.9	37.2	31.5
30	Imperial	67.0	62.0	51.3	34.8	36.9	41.9	38.1
31	Napa	59.0	56.4	47.3	36.4	38.9	32.6	28.4
32	Kings	65.5	60.1	58.7	40.1	37.8	35.7	30.4
33	Madera	67.8	62.2	57.4	41.8	39.7	41.3	33.4
34	Monterey*	60.7	58.1	47.5	35.2	40.1	35.0	31.2
35	Humboldt*	66.5	64.3	60.9	47.6	48.0	44.1	40.5
36	Nevada *	59.5	58.8	53.6	38.2	36.6	39.2	31.8
37	Mendocino*	60.9	61.8	51.6	43.2	39.5	42.8	39.9
38	Sutter*	66.2	67.3	55.4	40.1	40.8	38.4	32.0
39	Yuba*	66.2	67.3	57.3	42.5	40.3	35.9	33.0
40	Lake*	60.9	61.8	54.8	38.2	35.9	38.1	38.7
41	San Benito*	60.7	58.1	54.8	45.4	41.0	34.0	26.2
42	Tehama, Glen, Colusa	68.9	68.0	57.2	46.9	46.2	43.8	39.9
43	North Balance*	66.5	65.4	60.5	42.2	49.0	48.5	38.0
44	Sierra Balance*	58.0	57.2	53.0	42.5	42.2	36.4	34.5

* 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, 2011-2012 and 2013-2014 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 2013-2014

		Cycle						
Stratum	Description	2001	2003	2005	2007	2009	2009-2011	2013-2014
	State total	63.7	60.0	54.0	52.8	49.0	47.4	44.8
1	Los Angeles	60.0	55.1	50.5	48.7	43.6	42.8	41.3
2	San Diego	63.3	60.7	53.5	53.0	46.0	47.0	44.3
3	Orange	60.3	58.0	50.8	50.5	48.7	46.0	40.9
4	Santa Clara	61.2	64.3	55.9	55.7	52.9	48.5	47.2
5	San Bernardino	64.0	59.5	53.2	51.7	50.4	46.2	42.0
6	Riverside	64.7	58.7	52.0	50.4	51.4	45.2	42.8
7	Alameda	65.2	62.1	59.2	56.0	52.0	52.7	49.5
8	Sacramento	65.7	63.0	58.0	57.8	55.0	49.8	46.8
9	Contra Costa	64.9	66.3	59.6	56.9	51.8	52.6	46.1
10	Fresno	59.8	61.6	55.0	52.5	53.3	50.4	43.2
11	San Francisco	59.1	59.9	55.9	54.5	47.2	49.2	50.8
12	Ventura	63.7	60.3	49.5	54.1	52.4	49.4	42.8
13	San Mateo	60.4	61.4	58.3	55.3	50.9	48.2	47.5
14	Kern	66.6	65.5	51.9	53.9	47.0	47.2	47.8
15	San Joaquin	63.7	59.2	52.7	47.9	48.8	46.7	47.1
16	Sonoma	67.8	67.0	62.7	60.2	52.8	53.6	53.0
17	Stanislaus	64.2	62.4	56.3	52.5	51.1	46.8	46.2
18	Santa Barbara	66.1	64.6	53.5	58.8	54.1	48.1	45.7
19	Solano	63.9	60.8	53.9	53.0	45.0	49.1	46.3
20	Tulare	64.6	64.7	54.9	51.7	45.2	44.0	44.2
21	Santa Cruz	68.3	64.0	59.8	59.2	55.7	51.9	47.6
22	Marin	70.4	65.2	59.0	62.1	56.1	57.7	55.5
23	San Luis Obispo	69.7	64.9	62.1	65.3	59.3	58.0	51.2
24	Placer	68.2	63.0	56.6	55.6	56.8	47.9	48.2
25	Merced	64.0	57.7	57.7	50.6	49.6	47.3	41.9
26	Butte	67.6	69.5	61.2	65.6	55.2	57.0	56.0
27	Shasta	69.4	66.7	64.2	63.0	58.7	53.4	55.7
28	Yolo	69.3	66.3	59.5	61.2	56.4	55.3	50.5
29	El Dorado	67.6	64.4	60.7	57.7	54.5	56.4	50.7
30	Imperial	63.5	61.9	55.5	48.0	40.6	46.3	44.7
31	Napa	66.6	65.4	56.8	55.5	50.5	50.7	50.1
32	Kings	66.6	61.7	52.6	51.9	45.5	49.2	41.1
33	Madera	67.3	59.9	56.3	51.7	48.4	52.5	46.5
34	Monterey*	62.9	63.1	53.2	52.2	48.4	49.9	45.2
35	Humboldt*	69.6	71.0	64.9	64.6	65.7	57.9	63.4
36	Nevada *	70.5	66.1	64.0	61.7	56.8	57.3	52.4
37	Mendocino*	68.6	67.8	66.6	62.7	60.4	57.1	52.8
38	Sutter*	64.6	64.7	56.3	56.5	49.8	49.5	42.8
39	Yuba*	64.6	64.7	59.6	53.9	47.2	47.0	48.1
40	Lake*	68.6	67.8	58.4	60.0	57.9	55.0	53.4
41	San Benito*	62.9	63.1	48.0	51.6	46.2	46.0	42.9
42	Tehama, Glen, Colusa	65.9	63.0	63.9	56.8	55.1	52.5	46.4
43	North Balance*	69.6	72.3	67.7	66.2	58.0	62.1	54.7
44	Sierra Balance*	72.4	69.1	61.8	62.3	59.1	56.6	55.4

* 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, 2011-2012 and 2013-2014 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 2013-2014

Stratum	Description	Cycle						
		2001	2003	2005	2007	2009	2009-2011	2013-2014
	State total	87.6	81.4	75.2	73.7	72.9	73.2	68.9
1	Los Angeles	83.7	80.2	72.1	70.7	70.6	69.7	68.0
2	San Diego	88.5	84.2	74.8	72.5	70.2	74.9	71.4
3	Orange	84.5	77.5	73.1	72.2	71.4	75.2	62.7
4	Santa Clara	92.2	80.7	77.6	75.1	79.0	71.6	71.8
5	San Bernardino	91.2	80.3	76.9	69.9	72.9	75.0	69.3
6	Riverside	90.8	83.2	73.2	71.7	73.8	70.5	62.7
7	Alameda	90.3	81.1	75.6	81.4	73.9	79.7	74.9
8	Sacramento	86.3	77.8	78.3	78.6	77.3	74.9	66.8
9	Contra Costa	88.9	79.7	80.7	76.3	68.5	65.2	69.2
10	Fresno	88.9	86.2	79.9	74.5	71.7	79.2	74.2
11	San Francisco	88.5	79.4	73.2	69.0	65.6	75.1	66.1
12	Ventura	85.4	88.7	78.6	78.9	77.1	74.3	64.4
13	San Mateo	84.5	80.6	76.3	78.4	67.8	61.4	62.2
14	Kern	89.2	79.9	79.7	73.6	75.7	83.0	74.8
15	San Joaquin	89.9	86.7	78.5	77.7	80.2	69.7	72.8
16	Sonoma	95.0	91.1	78.1	79.9	82.0	70.9	58.3
17	Stanislaus	85.8	84.7	67.1	79.6	70.4	71.3	74.5
18	Santa Barbara	89.7	86.2	76.7	74.7	77.7	81.8	71.5
19	Solano	87.0	73.3	79.5	79.7	62.2	69.8	64.6
20	Tulare	91.0	77.2	69.2	78.1	64.4	75.4	73.5
21	Santa Cruz	88.6	80.2	77.6	79.6	79.6	74.9	71.6
22	Marin	89.1	88.3	80.2	70.8	75.1	77.9	67.9
23	San Luis Obispo	93.1	87.6	82.8	82.3	74.5	84.1	73.0
24	Placer	90.5	79.4	85.9	81.8	84.0	71.2	72.3
25	Merced	86.7	80.9	73.8	68.2	74.2	76.8	73.8
26	Butte	89.6	93.2	78.9	79.7	81.4	76.5	77.5
27	Shasta	87.0	86.9	89.5	72.0	85.5	94.6	73.4
28	Yolo	95.2	82.1	73.4	78.4	75.7	81.2	78.2
29	El Dorado	92.5	81.6	77.7	73.3	77.3	83.3	83.6
30	Imperial	82.4	72.1	68.5	74.4	72.7	74.5	68.3
31	Napa	84.0	89.1	81.0	70.4	72.0	77.0	51.8
32	Kings	89.5	88.2	81.4	68.4	69.0	78.9	69.4
33	Madera	85.6	85.1	80.1	84.6	79.0	71.7	68.3
34	Monterey*	87.2	81.8	76.7	69.9	74.1	69.7	67.1
35	Humboldt*	92.9	84.9	84.1	87.7	83.9	82.1	73.1
36	Nevada *	90.0	82.0	72.7	79.2	87.9	81.2	76.1
37	Mendocino*	87.8	87.5	84.6	73.3	75.9	73.5	86.8
38	Sutter*	90.4	92.1	79.3	66.8	71.7	83.1	71.2
39	Yuba*	90.4	92.1	79.8	76.6	71.0	87.1	80.9
40	Lake*	87.8	87.5	64.5	80.7	84.0	72.1	74.6
41	San Benito*	87.2	81.8	67.5	71.1	69.9	74.8	87.7
42	Tehama, Glen, Colusa	90.7	80.0	78.1	83.4	68.0	81.3	67.5
43	North Balance*	96.1	92.0	90.8	90.5	90.6	82.0	84.9
44	Sierra Balance*	93.7	89.8	82.1	83.1	78.8	84.0	79.8

* 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, 2011-2012 and 2013-2014 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 2013-2014

Stratum	Description	Cycle						
		2001	2003	2005	2007	2009	2011-2012	2013-2014
	State total	63.5	57.3	48.5	44.1	42.8	42.7	40.2
1	Los Angeles	58.5	56.5	43.8	41.9	40.3	41.0	41.4
2	San Diego	62.1	59.8	46.8	39.7	42.7	49.0	39.3
3	Orange	52.3	49.1	47.9	42.3	38.2	37.5	38.3
4	Santa Clara	60.1	60.0	53.6	46.3	40.2	34.4	43.9
5	San Bernardino	68.0	55.4	50.0	41.3	36.2	47.9	40.2
6	Riverside	64.8	55.2	49.4	45.2	43.5	42.2	43.1
7	Alameda	57.9	56.2	45.3	48.5	50.4	46.8	41.0
8	Sacramento	65.3	53.3	55.9	46.4	46.2	45.1	42.5
9	Contra Costa	64.1	64.8	53.6	48.5	49.4	33.2	37.3
10	Fresno	64.3	57.5	51.8	42.2	46.5	54.2	43.0
11	San Francisco	51.4	58.0	46.2	31.7	42.3	34.4	39.7
12	Ventura	60.6	60.8	46.9	48.6	42.8	33.8	19.9
13	San Mateo	65.0	51.1	52.6	52.4	42.6	30.5	30.8
14	Kern	66.2	58.1	57.9	46.2	45.8	49.0	41.4
15	San Joaquin	65.7	52.3	48.9	43.5	42.8	44.7	30.9
16	Sonoma	65.3	56.7	48.9	44.4	56.0	66.5	37.1
17	Stanislaus	60.7	60.9	54.0	51.1	44.8	41.8	39.9
18	Santa Barbara	63.2	67.3	59.6	46.5	48.8	63.8	32.9
19	Solano	65.6	60.3	45.0	45.9	47.0	37.8	49.7
20	Tulare	63.7	62.4	46.7	37.7	43.7	39.1	38.1
21	Santa Cruz	70.5	68.6	56.5	50.9	47.7	47.9	36.9
22	Marin	61.2	58.4	54.8	48.1	45.8	38.2	38.8
23	San Luis Obispo	65.0	63.0	55.0	54.5	40.4	60.0	30.5
24	Placer	70.1	67.0	50.7	44.4	44.4	38.2	45.5
25	Merced	65.2	64.8	45.1	37.8	42.9	44.4	52.5
26	Butte	64.5	60.7	56.1	60.0	55.0	49.0	59.2
27	Shasta	63.2	54.5	50.7	54.5	56.7	39.6	48.0
28	Yolo	68.8	58.7	61.5	55.5	58.0	42.8	47.8
29	El Dorado	74.2	57.9	59.4	54.4	47.3	41.3	40.2
30	Imperial	70.6	66.4	49.5	50.8	47.4	46.2	49.0
31	Napa	61.1	68.5	41.8	54.8	33.4	49.1	49.6
32	Kings	70.1	64.4	46.8	34.7	40.3	62.6	23.6
33	Madera	70.4	68.6	58.8	54.1	43.5	36.0	37.3
34	Monterey*	66.4	56.0	46.5	44.1	35.8	44.1	43.6
35	Humboldt*	69.1	60.9	44.2	61.7	59.7	58.7	49.7
36	Nevada *	78.8	72.0	48.9	51.1	48.9	52.4	42.3
37	Mendocino*	67.9	62.4	59.4	49.9	44.8	45.7	51.1
38	Sutter*	65.9	70.8	62.0	49.7	34.3	41.8	37.0
39	Yuba*	65.9	70.8	57.7	34.7	53.0	45.3	42.5
40	Lake*	67.9	62.4	52.6	46.5	66.8	52.2	32.1
41	San Benito*	66.4	56.0	58.3	45.1	41.3	44.5	47.5
42	Tehama, Glen, Colusa	70.4	57.0	54.2	48.7	45.8	49.7	43.8
43	North Balance*	68.1	69.7	61.8	54.5	54.4	34.6	49.1
44	Sierra Balance*	75.2	62.5	49.7	43.9	52.5	35.0	44.3

*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, 2011-2012 and 2013-2014 California Health Interview Survey.