



*October 2018*

CHIS 2017 Methodology Report Series

## Report 4

# Response Rates

**CALIFORNIA HEALTH INTERVIEW SURVEY**

**CHIS 2017 METHODOLOGY SERIES**

**REPORT 4**

**RESPONSE RATES**

**OCTOBER 2018**

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[www.chis.ucla.edu](http://www.chis.ucla.edu)

This report provides analysts with information about the response rates in CHIS 2017. 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.

**Suggested citation:**

California Health Interview Survey. *CHIS 2017 Methodology Series: Report 4 – Response Rates*. Los Angeles, CA: UCLA Center for Health Policy Research, 2018.

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The California Health Interview Survey is a collaborative project of the UCLA Center for Health Policy Research, the California Department of Public Health, and the Department of Health Care Services. Funding for CHIS 2017 came from multiple sources: the California Department of Health Care Services, the California Department of Health Care Services (Mental Health Services Division), the California Department of Public Health, The California Endowment, the California Health Benefit Exchange, the California Health Care Foundation, the California Wellness Foundation, First 5 California, Kaiser Permanente, San Diego County Health and Human Services Agency, and Imperial County Public Health Department.

## PREFACE

*Response Rates* is the fourth in a series of methodological reports describing the 2017 California Health Interview Survey (CHIS 2017). The other reports are listed below.

CHIS is a collaborative project of the University of California, Los Angeles (UCLA) Center for Health Policy Research, the California Department of Public Health, and the Department of Health Care Services. SSRS was responsible for data collection and the preparation of five methodological reports from the 2017 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 2017**

The methodological reports for CHIS 2017 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 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 2017 Methodology Series*:

*Report 2 – Data Collection Methods.* These methods are summarized 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://www.chis.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](mailto:CHIS@ucla.edu).

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# 1. CHIS 2017 SAMPLE DESIGN AND METHODOLOGY SUMMARY

## 1.1 Overview

A series of five methodology reports are available with more detail about the methods used in CHIS 2017.

- 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](mailto:CHIS@ucla.edu). For methodology reports from previous CHIS cycles, go to <http://www.chis.ucla.edu/chis/design/Pages/methodology.aspx>

The CHIS is a population-based telephone survey of California's residential, noninstitutionalized population conducted every other year since 2001 and continually beginning in 2011. CHIS is the nation's largest state-level health survey and one of the largest health surveys in the nation. The UCLA Center for Health Policy Research (UCLA-CHPR) conducts CHIS in collaboration with the California Department of Public Health and the California 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 and optimized to meet 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 racial and ethnic subgroups.

The CHIS sample is representative of California's non-institutionalized population living in households. CHIS data and results are used extensively by federal and State agencies, local public health agencies and organizations, advocacy and community organizations, other local agencies, hospitals, community clinics, health plans, foundations, and researchers. These data are used for analyses and publications to assess public health and health care needs, to develop and advocate policies to meet those

needs, and to plan and budget health care coverage and services. Many researchers throughout California and the nation use CHIS data files to further their understanding of a wide range of health related issues (visit UCLA-CHPR's publication page at <http://healthpolicy.ucla.edu/publications/Pages/default.aspx> for examples of CHIS studies).

## **1.2 Switch to a Continuous Survey**

From the first CHIS cycle in 2001 through 2009, CHIS data were collected during a 7 to 9 month period every other year. Beginning in 2011, CHIS data have been collected continually over a 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 2017 data were collected between June and December, 2017. 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 year for the age group corresponding to the data file in use (adult, adolescent, or child). In CHIS 2017, data users will be able to produce single-year estimates using the weights provided.

**See what's new in the 2017 CHIS sampling and data collection here:**

<http://www.chis.ucla.edu/chis/design/Documents/whats-new-chis-2017.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 statistical code, is available at <http://www.chis.ucla.edu/chis/analyze/Pages/sample-code.aspx>.

Additional documentation on constructing the CHIS sampling weights is available in the *CHIS 2017 Methodology Series: Report 5—Weighting and Variance Estimation* posted at <http://www.chis.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.

### 1.3 Sample Design Objectives

The CHIS 2017 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 racial and 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 RDD sample was designed to achieve the required number of completed adult interviews by using approximately 50% landline and 50% cellular phone numbers. For the 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 same geographic stratification of the state has been used since CHIS 2005. The Los Angeles County stratum included eight sub-strata for Service Planning Areas, and the San Diego County stratum included six sub-strata for Health Service Districts. Most of the strata (39 of 44) consisted of a single county with no sub-strata (see counties 3-41 in Table 1-1). Three multi-county strata comprised the 17 remaining counties (see counties 42-44 in Table 1-1). A sufficient number of adult interviews were allocated to each stratum and sub-stratum to support the first sample design objective for the two-year period—to provide health estimates for adults at the local level. Asian surname sample list frames added 38 Korean, and 74 Vietnamese adult interviews based on self-identified ethnicity for the 2017 survey year.<sup>1</sup> Additional samples from both the landline and cell phone frames produced 635 interviews in 2017 within San Diego County. Furthermore, an address-based sample from the USPS Delivery Sequence File produced 332 landline or cell phone interviews in 2017 within the northern part of Imperial County.

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 of the randomly selected parent/guardian were randomly selected; the adolescent was interviewed directly, and the adult sufficiently knowledgeable about the child's health completed the child interview.

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<sup>1</sup> For the 2017, all sample frames produced totals of 113 Korean, and 148 Vietnamese adult interviews.

Table 1-1. California county and county group strata used in the CHIS 2017 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, Glenn, 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, 2017 California Health Interview Survey.

The CHIS RDD 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). However, given the smaller sample sizes of one-year data files, two or more pooled cycles years of CHIS data are generally required to produce statistically stable estimates for small population groups such as racial/ethnic subgroups, children, teens, etc. 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 increase the sample size further for Koreans and Vietnamese.

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 2017, the goal was to complete approximately 50% of all RDD interviews statewide with adults contacted via cell

phone. Because the geographic information available for cell phone numbers is limited and not as precise as that for landlines, cell phone numbers were assigned to the same 44 geographic strata (i.e., 41 strata defined by a single county and 3 strata created by multiple counties) using a classification associated with the rate center linked to the account activation. 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. The adult owner of the sampled cell phone number was automatically selected for CHIS. Cell numbers used exclusively by children under 18 were considered ineligible. A total of 448 teen interviews and 1,600 child interviews were completed in CHIS 2017 with approximately 51% of teen interviews and 66% of child interviews coming from the cell phone sample.

The cell phone sampling method used in CHIS has evolved significantly since its first implementation in 2007 when only cell numbers belonging to adults in cell-only households were eligible for sampling adults. These changes reflect the rapidly changing nature of cell phone ownership and use in the US.<sup>2</sup> There have been three 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 third, enacted in CHIS 2015-2016 was to increase the fraction of the sample comprised of cell phones from 20% to 50% of completed interviews. In 2017, we additionally sampled out-of-area cell phone numbers. These are cell phone numbers with exchanges outside of California that can be matched to an address that is within California, indicating that the owner of the cell phone resides in California but purchased a cell phone in another state.

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 seven geographic sampling strata

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<sup>2</sup> <https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201806.pdf>

created using telephone area codes. In CHIS 2009 and 2011-2012, the number of cell phone strata was increased to 28. These strata were created using both area codes and the geographic information assigned to the number. Beginning in CHIS 2011, with the availability of more detailed geographic information, the number of strata was increased to 44 geographic areas that correspond to single and grouped counties similar to the landline strata. The use of 44 geographic strata continued in CHIS 2017.

#### **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 Tagalog. Tagalog interviews were conducted for part of the CHIS 2013-2014 cycle, but 2015-2016 were the first cycle years that Tagalog interviews were conducted from the beginning of data collection. 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.

SSRS designed the methodology and collected data for CHIS 2017, under contract with the UCLA Center for Health Policy Research. SSRS is an independent research firm that specializes in innovative methodologies, optimized sample designs, and reaching low-incidence populations. For all sampled households, SSRS 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. If 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 2017 by the type of sample (landline RDD, surname list, cell RDD, and ABS). Note that these figures were accurate as of data collection completion for 2017 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://www.chis.ucla.edu/chis/design/Pages/sample.aspx>.

Table 1-2. Number of completed CHIS 2017 interviews by type of sample and instrument

Type of sample <sup>1</sup>	Adult <sup>2</sup>	Child	Adolescent
Total all samples	21,153	1,600	448
Landline RDD <sup>3</sup>	9,831	501	206
Cell RDD	10,722	1,037	219
Vietnamese surname list landline	47	6	2
Vietnamese surname list cell phone	44	4	3
Korean surname list landline	133	9	3
Korean surname list cell phone	19	1	
Both Korean and Vietnamese Landline	18		
Imperial County ABS Oversample	339	42	15

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

<sup>1</sup> Completed interviews listed for each sample type refer to the sampling frame from which the phone number was drawn. Interviews could be conducted using numbers sampled from a frame with individuals who did not meet the target criteria for the frame but were otherwise eligible residents of California. For example, only 69 of the 120 adult interviews completed from the Vietnamese surname list involved respondents who indicated being having Vietnamese ethnicity.

<sup>2</sup> Includes interviews meeting the criteria as partially complete.

<sup>3</sup> Breakdown of completes by frame deviates slightly from original sample numbers due to numbers changing frames following post-sampling database processing.

Interviews in all languages were administered using SSRS’s computer-assisted telephone interviewing (CATI) system. The average adult interview took about 43 minutes to complete. The average child and adolescent interviews took about 19 minutes and 24 minutes, respectively. For “child-first” interviews, additional household information asked as part of the child interview averaged about 14 minutes. Interviews in non-English languages typically took longer to complete with an average length of about 53 minutes for the adult interview, 31 minutes for the teen, and 21 minutes for the child. More than seven percent of the adult interviews were completed in a language other than English, as were about 13 percent of all child (parent proxy) interviews and seven percent of all adolescent interviews.

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

Table 1-3. CHIS 2017 survey topic areas by instrument

<b>Health status</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
General health status	✓	✓	✓
Days missed from work or school due to health problems	✓	✓	✓
<b>Health conditions</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Asthma	✓	✓	✓
Diabetes, gestational diabetes, pre-diabetes/borderline diabetes	✓		
Heart disease, high blood pressure	✓		
Physical disability	✓		
Physical, behavioral, and/or mental conditions			✓
Developmental assessment, referral to a specialist by a doctor			✓
<b>Mental health</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Mental health status	✓	✓	
Perceived need, access and utilization of mental health services	✓	✓	
Functional impairment, stigma, three-item loneliness scale	✓		
Suicide ideation and attempts	✓	✓	
<b>Health behaviors</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Dietary and water intake, breastfeeding (younger than 3 years)	✓	✓	✓
Physical activity and exercise		✓	✓
Commute from school to home		✓	✓
Walking for transportation and leisure	✓		
Marijuana	✓	✓	
Opioid use	✓		
Alcohol, cigarette use, E-cigarette	✓	✓	
Sexual behaviors	✓	✓	
HIV testing, HIV prevention medication	✓	✓	
Sleep and technology		✓	
Sedentary time		✓	✓
Contraceptive use	✓	✓	
<b>Women's health</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Pregnancy status, postpartum care	✓		
<b>Dental health</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Last dental visit, main reason haven't visited dentist	✓	✓	✓
Current dental insurance coverage	✓		✓
Condition of teeth	✓		

(continued)

Table 1-3. CHIS 2017 survey topic areas by instrument (continued)

<b>Neighborhood and housing</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Safety, social cohesion	✓	✓	✓
Homeownership, length of time at current residence	✓		
Park use, park and neighborhood safety		✓	✓
Civic engagement	✓	✓	
<b>Access to and use of health care</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Usual source of care, visits to medical doctor	✓	✓	✓
Emergency room visits	✓	✓	✓
Delays in getting care (prescriptions and medical care)	✓	✓	✓
Communication problems with doctor	✓		✓
Discrimination	✓		
Timely appointment	✓		✓
Access to specialist and general doctors	✓		
Tele-medical care	✓		
<b>Voter engagement</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Voter engagement	✓		
<b>Food environment</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Access to fresh and affordable foods	✓		
Availability of food in household over past 12 months	✓		
Hunger	✓		
<b>Health insurance</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Current insurance coverage, spouse's coverage, who pays for coverage	✓	✓	✓
Health plan enrollment, characteristics and assessment of plan	✓	✓	✓
Whether employer offers coverage, respondent/spouse eligibility	✓		
Coverage over past 12 months, reasons for lack of insurance	✓	✓	✓
High deductible health plans	✓	✓	✓
Partial scope Medi-Cal	✓		
Medical debt, hospitalizations	✓		
<b>Public program eligibility</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Household poverty level	✓		
Program participation (CalWORKs, Food Stamps, SSI, SSDI, WIC, TANF)	✓	✓	✓
Assets, child support, Social security/pension	✓		
Medi-Cal eligibility, Medi-Cal renewal	✓		
Reason for Medi-Cal non-participation	✓		

(continued)

Table 1-3. CHIS 2017 survey topic areas by instrument (continued)

<b>Bullying</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Bullying, school safety		✓	
<b>Parental involvement/adult supervision</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Parental involvement			✓
Parental support, teach support		✓	
<b>Child care and school</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Current child care arrangements			✓
Paid child care	✓		
First 5 California: Talk, Read, Sing Program / Kit for New Parents			✓
Preschool/school attendance, school name		✓	✓
Preschool quality			✓
School instability, school programs and organizational involvement		✓	
<b>Employment</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Employment status, spouse's employment status	✓		
Hours worked at all jobs	✓		
Industry and occupation, firm size	✓		
<b>Income</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Respondent's and spouse's earnings last month before taxes	✓		
Household income, number of persons supported by household income	✓		
<b>Respondent characteristics</b>	<b>Adult</b>	<b>Teen</b>	<b>Child</b>
Race and ethnicity, age, gender, height, weight	✓	✓	✓
Veteran status	✓		
Marital status, registered domestic partner status (same-sex couples)	✓		
Sexual orientation, gender identity	✓		
Gender expression		✓	
Living with parents	✓		
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, 2017 California Health Interview Survey.

## 1.5 Response Rates

The overall response rates for CHIS 2017 are composites 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). For CHIS 2017, the landline/list sample household response rate was 9.3 percent (the product of the screener response rate of 13.2 percent and the extended interview response rate at the household level of 70.3 percent). The cell sample household response rate was 6.5 percent, incorporating a screener response rate of 10.0 percent household-level extended interview response rate of 65.2 percent. CHIS uses AAPOR response rate RR4 (see more detailed in *CHIS 2017 Methodology Series: Report 4 – Response Rates*).

Within the landline and cell phone sampling frames for 2017, the extended interview response rate for the landline/list sample varied across the adult (61.0 percent), child (63.3 percent) and adolescent (26.6 percent) interviews. The adolescent rate includes the process of obtaining permission from a parent or guardian.

The adult interview response rate for the cell sample was 66.6 percent, the child rate was 63.9 percent, and the adolescent rate was 20.3 percent in 2017 (see Table 1-4a). Multiplying these rates by the screener response rates used in the household rates above gives an overall response rate for each type of interview for each survey year (see Table 1-4b). As in previous years, household and person level response rates vary by sampling stratum. CHIS response rates are similar to, and sometimes higher than, other comparable surveys that interview by telephone.

Table 1-4a. CHIS response rates - Conditional

Type of Sample	Screener	Household	Adult (given screened)	Child (given screened & eligibility)	Adolescent (given screened & permission)
Overall	11.0%	66.8%	63.0%	63.7%	23.4%
Landline RDD/List	13.2%	70.3%	61.0%	63.3%	26.6%
Cell RDD/List	10.0%	65.2%	66.6%	63.9%	20.3%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

Table 1-4b. CHIS response rates - Unconditional

Type of Sample	Screener	Household	Adult (given screened)	Child (given screened & eligibility)	Adolescent (given screened & permission)
Overall	11.0%	7.1%	6.7%	6.7%	2.4%
Landline RDD/List	13.2%	9.3%	8.1%	8.4%	3.5%
Cell RDD/List	10.0%	6.5%	6.6%	6.4%	2.0%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

To maximize the response rate, especially at the screener stage, an advance letter in six 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 36.5 percent of the landline RDD sample telephone numbers not identified by the sample vendor as business numbers or not identified by SSRS’s dialer software as nonworking numbers, and for 100 percent of surname list sample numbers. Combining these two frames, advance letters were sent to 36.9 percent of all fielded landline telephone numbers. For cell sample, an advance letter was mailed for 38.5 percent of the RDD sample telephone numbers not identified by the sample vendor as business numbers or not identified by SSRS’s dialer software as nonworking numbers, and for 100 percent of surname list sample numbers. Combining these two frames, advance letters were sent to 40.7 percent of all fielded cell telephone numbers. As in all CHIS cycles since CHIS 2005, a \$2 bill was included with the CHIS 2017 advance letter to encourage cooperation. Unlike previous cycles, additional incentives were not offered to cell phone and nonresponse follow up (NRFU) respondents.

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.

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. In CHIS 2017, either a spouse/partner or adult child completed a proxy interview for 3 adults. A reduced questionnaire, with questions identified as appropriate for a proxy respondent, was administered.

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

## 1.6 Weighting the Sample

To produce population estimates from CHIS data, weights were 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 was weighted to represent the noninstitutionalized population for each sampling stratum and statewide. The weighting procedures used for CHIS 2017 accomplish the following objectives:

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

As part of the weighting process, a household weight was created for all households that completed the screener interview. This household weight is the product of the “base weight” (the inverse of the probability of selection of the telephone number) and a variety of adjustment factors. The household weight was used to compute a person-level weight, which includes adjustments for the within-household sampling of persons and for nonresponse. The final step was to adjust the person-level weight using weight calibration, a procedure that forced the CHIS weights to sum to estimated population control totals simultaneously from an independent data source (see below).

Population control totals of the number of persons by age, race, and sex at the stratum level for CHIS 2017 were created primarily from the California Department of Finance’s (DOF) 2017 Population Estimates, and associated population projections. The procedure used several 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), and education. 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 calibration.

The DOF control totals used to create the CHIS 2017 weights are based on 2010 Census counts, as were those used for the 2015-2016 cycle. Please pay close attention when comparing estimates using CHIS 2017 data with estimates using data from CHIS cycles before 2010. The most accurate California population figures are available when the U.S. Census Bureau conducts the decennial census. For periods between each census, population-based surveys like CHIS must use population projections based on the decennial count. 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.

## **1.7 Imputation Methods**

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

Three different imputation procedures were used by SSRS 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. The hot deck approach is one of the most commonly used methods for assigning values for missing responses. Using a hot deck, a value reported by a respondent for a specific item was 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 answered a survey item formed a pool of donors, while the item nonrespondents formed a group of recipients. A recipient was matched to the subset pool of donors based on household and individual characteristics. A value for the recipient was then randomly imputed from one of the donors in the pool. SSRS used hot deck imputation to impute the same items that have been imputed in all CHIS cycles since 2003 (i.e., race, ethnicity, home ownership, and education). The last technique was external data assignment. This method was used for geocoding

variables such as strata, SPA, HSR, and zip where the respondent provided inconsistent information. For such cases geocoding information was used for imputation.

UCLA-CHPR imputed missing values for nearly every variable in the data files other than those imputed by SSRS and some sensitive variables for which nonresponse had its own meaning. Overall, item nonresponse rates in CHIS 2017 were low, with most variables missing valid responses for less than 1% of the sample.

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 without donor replacement was used. This method replaced 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 corresponded to the nature of the variable being imputed (e.g. linear regression for continuous variables, logistic regression for binary variables, etc.). Donors and recipients were 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 SSRS. UCLA-CHPR began their imputation process by imputing household income and educational attainment, so that these characteristics are available for the imputation of other variables. Sometimes 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.

The imputation order of the other variables generally followed the questionnaire. After all imputation procedures were complete, every step in the data quality control process was performed once again to ensure consistency between the imputed and non-imputed values on a case-by-case basis.

## 2. USE OF RESPONSE RATES

Response rates provide one indicator of the success of a survey at representing the population sampled. 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 Groves and Peytcheva (2008) have provided examples that show the correlation between response rates and nonresponse bias is often weak. More recently, Brick and Tourangeau (2017) reexamined the data compiled by Groves and Peytcheva (2008) and show evidence for a between-study component of variance in addition to the within-study variance identified by Groves and Peytcheva (2008). This finding implies that response rates could be correlated with nonresponse bias so that surveys with higher response rates have less nonresponse bias in their estimates. Alternative measures that are more related to nonresponse bias have been proposed (see Wagner, 2012), but response rates are still reported as an indicator of the overall success of a data collection effort.

The main objectives of this report are: (1) to present response rates to analysts of CHIS 2017 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, 2016). For example, weighting accounts for differences in sampling rates by county and facilitates appropriate state-level response rate reporting.

Sample weights are used in computing response rates because 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 respondents and nonrespondents on the characteristic being measured. If we assume the population is partitioned into a stratum of respondents ( $R$ ) and a stratum of nonrespondents ( $NR$ ), survey estimates are computed only with the observations from the respondent stratum. Each observation from a respondent is weighted by the inverse of its selection probability. In a probability sample survey, the bias attributable to nonresponse of  $\bar{y}_r$  would be:

$$bias(\bar{y}_r) = (1 - r)(\bar{Y}_R - \bar{Y}_{NR}) \quad (2-1)$$

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 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. If the county samples are not weighted by their selection probabilities, then the response rate cannot be used in this nonresponse bias equation.

### 3. DEFINING RESPONSE RATES

The term “response rate” is used in many 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) and AAPOR (The American Association for Public Opinion Research, 2016). The AAPOR report is periodically updated and is available on the organization’s website.

We used the definitions described in the AAPOR guidelines, which include several different response rate definitions. Among these, RR3 and RR4 are most commonly accepted in the current survey research field for telephone surveys like CHIS. The only difference between them is that RR3 does not include partial completes in the numerator while RR4 does. This report uses AAPOR’s RR4 for the telephone samples in CHIS 2017 (landline, surname list, and cell phone samples). The 2017 address-based sample (ABS) in Imperial County is excluded from the computation of overall 2017 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. 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). A voicemail message or answering machine may not indicate whether a number is used for a business or a residence and additionally, for those that are residential there is not enough information to know whether the residence is actually in California or not. 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. The approach we used for estimating  $e$  was recommended by AAPOR (2016). This formula estimates  $e$  as the proportion of cases of known eligibility divided by all cases with known eligibility, both known

eligible and known ineligible (AAPOR, 2016). This approach was used 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 specific 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 2017.

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 has permitted child or adolescent interviews to be done before the adult interview under certain circumstances in the landline and surname list samples. This results in a computed 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 2017.

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 2017 BRFSS Data Quality Summary report (Centers for Disease Control and Prevention, 2018). 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. For example, the 2017 California BRFSS AAPOR response rate 4 for landline and cell phone sample combined was 31.4 percent, over 4 times higher than the overall response rate for CHIS 2017 of 6.7 percent (Centers for Disease Control and Prevention, 2018). Chapter 7 in this report addresses differences between the BRFSS and CHIS response rate calculations that could explain some of the difference in overall response rates. As such, the BRFSS and CHIS overall response rates are not strictly comparable without accounting for these differences. In addition, comparing response rates between two surveys provides only a general sense of the relative representativeness of each survey. Specific differences in methods and protocols between surveys could produce different outcomes in nonresponse bias for key estimates that are not associated with lower or higher response rates (Groves and Peytcheva, 2008).

## 4. REVIEW OF CONTACT METHODS

### 4.1 Landline and Surname 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 just under 3 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 just over 41 minutes in English, the child interview under 17 minutes, and the adolescent interview over 23 minutes. Interviews in languages other than English generally took longer than these averages. Detailed interview timing information is given in *CHIS 2017 Methodology Series: Report 2 – Data Collection Methods*.

Before calling landline or surname list sample telephone numbers, SSRS 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 2017, 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 to 3 weeks following the refusal.

A similar process was used at the extended level for sampled adults, children and teens in the landline, and surname list samples. 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 2017. 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 an adult child of the sampled adult completed a proxy interview in these cases; 3 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 surname list samples.

## 5. RESPONSE RATE FORMULAS

This chapter describes the formulas used to compute the response rates for CHIS 2017. 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 by frame, 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:

$$rr_s = \frac{\sum_{i \in S_{resp}} w_i}{\sum_{i \in S_{elig}} w_i} \quad (5-1)$$

where  $w_i$  is the weight for household  $i$  in the stratum after adjusting for differential sampling rates (see *CHIS 2017 Methodology Series: Report 2 – Data Collection Methods*). It is also adjusted for the assignment of sampled units with unknown residential status and the assignment of households with unknown eligibility status. For both the cell and landline samples,  $S_{resp}$  is the set of households in the stratum that responded to the screening interview and  $S_{elig}$  is the set of households in the stratum that were eligible. As noted earlier, the estimated eligibility 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 and then the proportion of sampled units with unknown eligibility status is estimated by the observed proportion of eligible telephone numbers among cases where eligibility status is known; these rates are computed separately for landline and cell.

The screener response rate for the state by frame type 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 for a specific frame type where the weights are equal to the population size 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.

As mentioned in the previous chapter, because of the child-first procedure, some sampled households in the landline 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 an adult, child, or adolescent extended interview was completed. The household extended interview response rate is computed as:

$$rr_h = \frac{\sum_{i \in H_{resp}} w_i^*}{\sum_{i \in H_{scr}} w_i^*} \quad (5-2)$$

where  $w_i^*$  is the 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 one because of the assumption that there is one adult user per cell phone number. Because of this weighting, adults sampled from landline households with more than one adult have a larger effect on the response rate than those in cell households and landline households with only one adult. The extended adult response rate ( $rr_a$ ) is computed as

$$rr_a = \frac{\sum_{i \in A_{resp}} w_i^a}{\sum_{i \in A_{elig}} w_i^a} \quad (5-3)$$

where the numerator is summed over all adult respondents in 2017, and the denominator is summed over all eligible sampled adults. The weight being summed in this case,  $w_i^a$  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 samples. *If*

the adult interview was conducted before the child interview because the conditions for the child-first procedure were not met, then the child and adolescent extended response rates include only those households in which the adult extended interview is completed. In this case, the child or adolescent rate is conditional on the adult interview. If the child first procedure was implemented, then the child response rate is conditioned only on the screener. The **extended child response rate** ( $rr_c$ ) is:

$$rr_c = \frac{\sum_{i \in C_{resp}} w_i^n}{\sum_{i \in C_{elig}} w_i^n} \quad (5-4)$$

where the numerator is summed over all completed child interviews in 2017, and the denominator is summed over all eligible sampled children. The weight being summed in this case,  $w_i^n$ , is the inverse of the probability of selecting the child within the household.

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

$$rr_t = \frac{\sum_{i \in T_{resp}} w_i^m}{\sum_{i \in T_{elig}} w_i^m} \quad (5-5)$$

where the numerator is summed over all adolescent respondents in 2017, and the denominator is summed over all eligible sampled adolescents. The weight being summed in this case, is the inverse of the probability of selecting the adolescent within the household. Again, is used to identify the rate for adolescents sampled in the screener, and 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 (5-5) 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).

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:

$$orr_h = rr_s \bullet rr_h \quad (5-6)$$

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:

$$orr_a = rr_s \bullet rr_a \quad (5-7)$$

In the landline/surname list samples, the **child response rate** is conditioned on the screener being completed and on the adult interview being completed for households with children where a child was not sampled in the screener. To discriminate between the different sampling situations, we add a subscript  $K$  to identify the procedure. The overall response rate for the child, is defined as:

$$orr_c = rr_s \bullet (p_{Kc} \bullet rr_{c,K} + p_{\bar{K}c} \bullet rr_{ac,\bar{K}} \bullet rr_{c,\bar{K}}) \quad (5-8)$$

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  $p_{Kc}$   $p_{\bar{K}c}$  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.,  $p_{Kc} + p_{\bar{K}c} = 1$ ). In the cell phone sample, where child-first procedures were not used, the overall child response rate is similar to (5-7), that is, the product of the screener response rate and the child extended interview response rate.

In the landline/surname 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:

$$orr_t = rr_s \bullet (p_{Kt} \bullet rr_{t,K} + p_{\bar{K}t} \bullet rr_{at,\bar{K}} \bullet rr_{t,\bar{K}}) \quad (5-9)$$

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 is not presented because it is not

of much interest as an overall rate. Similar to 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 (5-6) and (5-7), respectively, use the sample screener response rate, household extended response rate, and adult response rate for the cell phone sample. Since there was no child-first procedure in the cell phone sample, the overall response rate for children in the cell phone sample is conditioned on the completion of the adult interview and is computed as:

$$ORR_{c\_cell} = rr_{s\_cell} \cdot rr_{ac\_cell} \cdot rr_{c\_cell} \quad (5-10)$$

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  $rr_{t\_cell}$ .<sup>3</sup>

In addition, we computed the **overall response rate for the combined landline/surname list and cell phone samples**. The adult response rate is the weighted average of the overall response rates of adults in the landline or surname list samples and adults in the cell sample. These overall rates are

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<sup>3</sup> 2013-2014 CHIS Methodology Series: Report 4 – Response Rates used the subscript  $c\_cell$  for the adolescent extended interview response rate, is element, but the subscript for this element should be  $t\_cell$ , consistent with formulas 5 and 9.

weighted by the weighted sample size. The overall combined response rate for the landline/surname list and cell phone adult sample,  $orr_{a\_comb}$ , is computed as:

$$orr_{a\_comb} = p_{a\_LL} \cdot rr_{a\_LL} + p_{a\_cell} \cdot rr_{a\_cell} \quad (5-11)$$

where the proportions  $p_{a\_LL}$  and  $p_{a\_cell}$  are the weighted proportions of adults by sampling frame.

The overall combined response rate for the landline/surname list and cell phone child sample,  $orr_{c\_comb}$ , is computed as:

$$orr_{c\_comb} = p_{c\_LL} \cdot rr_{c\_LL} + p_{c\_cell} \cdot rr_{c\_cell} \quad (5-12)$$

where the proportions  $p_{c\_LL}$  and  $p_{c\_cell}$  are the weighted proportions of children by sampling frame.

The overall combined response rate for the landline/surname list and cell phone adolescent sample,  $orr_{t\_comb}$ , is computed as:

$$orr_{t\_comb} = p_{t\_LL} \cdot rr_{t\_LL} + p_{t\_cell} \cdot rr_{t\_cell} \quad (5-13)$$

where the proportions  $p_{t\_LL}$  and  $p_{t\_cell}$  are the weighted proportions of adolescents by sampling frame.

## 6. RESPONSE RATE TABLES

This chapter provides tables of response rates for the different samples used in CHIS 2017. The first section presents 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 the rates are weighted and use the formulas presented in the previous chapter.

### 6.1 Screener Response Rates

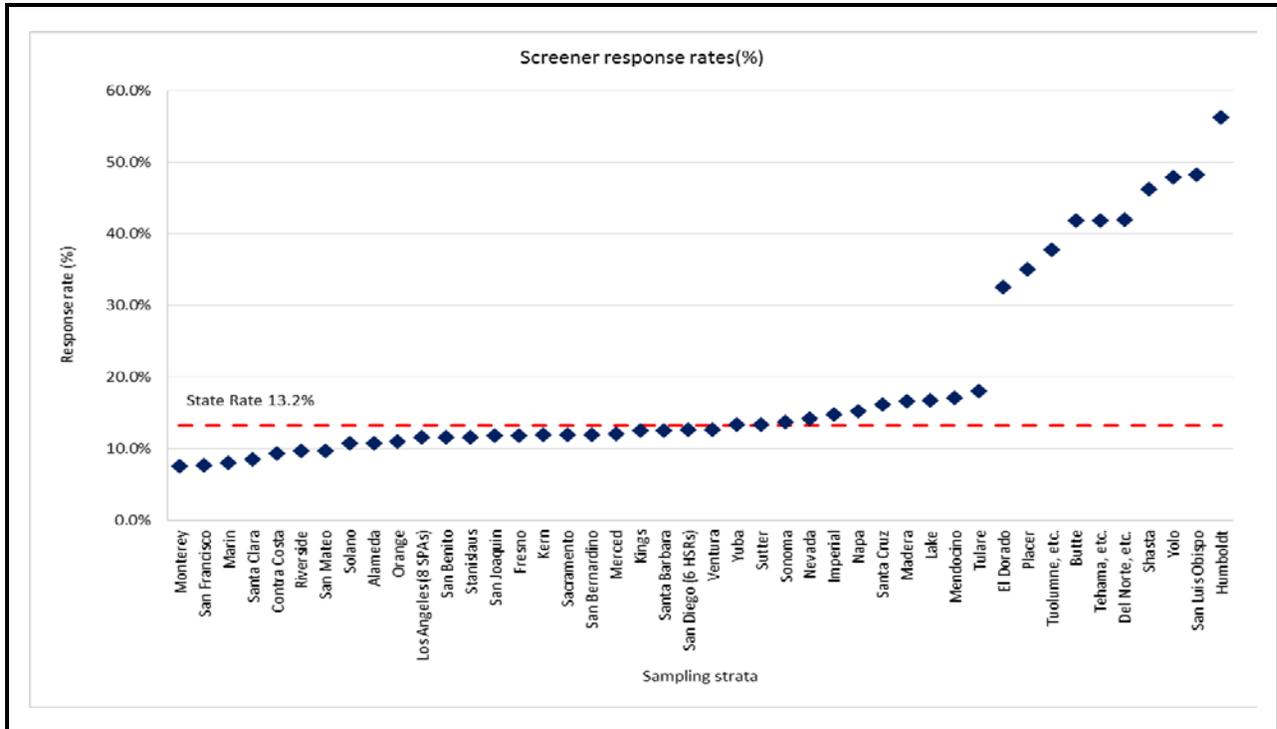
The screener response rates for the combined landline and surname list samples, by sampling stratum, are given in Table 6-1. The first column in the table gives the number of households in the landline/surname list samples that completed the screening interview. Overall, 16,054 households from these samples completed the CHIS 2017 screener interview. In each of these households, one adult was sampled. Please note, all landline and cell sample numbers reported in the current report are based on the original sampling frame and not the actual sampling frame based on dialing.

As Figure 6-1 shows, the overall weighted screener response rate for the state, including the sample drawn from the landline and surname lists, is 13.2 percent. As discussed in Chapter 3, this response rate was computed using the CASRO method to allocate the numbers whose eligibility cannot be determined (eq. 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*. 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.

The table shows that the screener response rates for the landline/surname list samples vary by county, which is also illustrated in Figure 6-1. The median response across all counties is 12.6 percent, and the highest response rate is 56.2 percent in the stratum for Humboldt. Monterey has the lowest response rate at 7.6 percent while the next lowest response rate (San Francisco, which has been the lowest

in the past) is about 0.1 points higher than the Monterey rate. The screener response rate in Los Angeles is 3.8 points higher than the San Francisco rate and 1.7 points lower than the state response rate. The county rankings shown in Figure 6-1 are similar to those in previous CHIS cycles. The mean screener response rate in CHIS 2015-2016 for landline/surname list sample was 20.6 percent, so the response rate decreased by 7.4 percentage points in 2017.

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



The median response rate for counties with a population of more than 500,000 persons (as of January 1, 2016 which consists of the counties from Los Angeles through Stanislaus in Table 6-1) is 11.6 percent. This is 5 percentage points lower than the 16.6 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 advance letter impacts later in chapter 7.

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

	Stratum <sup>3</sup>	Advance letter mailed					
		Total		Yes		No	
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)
	State total	16,054	13.2%	12,499	15.6%	3,555	9.0%
1	Los Angeles (8 SPAs)	3,137	11.5%	2,597	12.4%	540	8.0%
2	San Diego (6 HSRs)	1,664	12.6%	1,230	13.1%	434	10.0%
3	Orange	1,220	11.0%	946	11.7%	274	8.4%
4	Santa Clara	573	8.5%	473	11.8%	100	4.4%
5	San Bernardino	605	12.0%	459	12.4%	146	10.2%
6	Riverside	948	9.6%	806	11.9%	142	5.8%
7	Alameda	439	10.7%	321	12.6%	118	8.1%
8	Sacramento	411	11.9%	309	17.9%	102	6.6%
9	Contra Costa	343	9.3%	276	13.3%	67	4.7%
10	Fresno	325	11.8%	246	15.8%	79	7.8%
11	San Francisco	247	7.7%	189	10.5%	58	4.6%
12	Ventura	300	12.6%	251	13.0%	49	9.0%
13	San Mateo	282	9.7%	207	11.0%	75	7.6%
14	Kern	278	11.9%	225	16.1%	53	6.5%
15	San Joaquin	195	11.8%	141	15.1%	54	8.7%
16	Sonoma	148	13.6%	117	21.5%	31	6.4%
17	Stanislaus	187	11.6%	153	15.4%	34	6.5%
18	Santa Barbara	175	12.5%	136	18.9%	39	7.0%
19	Solano	142	10.7%	105	13.6%	37	7.3%
20	Tulare	150	18.1%	120	21.4%	30	11.7%
21	Santa Cruz	165	16.2%	129	20.6%	36	11.0%
22	Marin	203	8.0%	144	13.4%	59	4.8%
23	San Luis Obispo	148	48.2%	131	52.8%	17	28.8%
24	Placer	128	35.1%	103	44.8%	25	18.7%
25	Merced	182	12.0%	133	14.8%	49	9.0%
26	Butte	171	41.9%	128	48.5%	43	29.9%
27	Shasta	216	46.3%	158	50.2%	58	38.3%
28	Yolo	129	47.9%	107	53.9%	22	31.4%
29	El Dorado	126	32.6%	97	40.0%	29	20.1%

(continued)

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

Stratum <sup>3</sup>	Total		Advance letter mailed				
	Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Yes		No		
			Complete	Response rate (%)	Complete	Response rate (%)	
30	Imperial	297	14.7%	252	16.8%	45	10.2%
31	Napa	176	15.2%	130	18.4%	46	10.6%
32	Kings	217	12.5%	162	15.8%	55	9.1%
33	Madera	223	16.6%	146	22.3%	77	12.0%
34	Monterey	144	7.6%	111	12.2%	33	3.7%
35	Humboldt	205	56.2%	171	61.8%	34	38.6%
36	Nevada	225	14.2%	164	19.9%	61	8.8%
37	Mendocino	155	17.1%	88	22.0%	67	14.6%
38	Sutter	227	13.4%	174	18.4%	53	7.6%
39	Yuba	224	13.4%	143	16.9%	81	10.5%
40	Lake	162	16.8%	95	22.9%	67	12.7%
41	San Benito	211	11.6%	170	13.0%	41	8.1%
42	Tehama, etc.	135	41.9%	110	45.6%	25	30.9%
43	Del Norte, etc.	104	41.9%	64	50.8%	40	32.8%
44	Tuolumne, etc.	112	37.8%	82	49.7%	30	22.9%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

Note. Dividing line separates counties with a population of more than 500,000 persons as of January 1, 2016.

<sup>1</sup> A complete here includes any HH with a completed screening interview

<sup>2</sup> Response rate is calculated as the sum of completes and partial completes divided by the sum of eligible cases and unknown cases (adjusted by the eligibility rate).

<sup>3</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata

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, 16,916 screener interviews were completed statewide and the weighted state screener response rate was 10.0 percent. The screener response rate in CHIS 2015-2016 for the cell phone sample was 19.6 percent, so the response rate decreased by 9.6 percentage points in 2017.

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

	Stratum <sup>3</sup>	Advance letter mailed					
		Total		Yes		No	
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)
	State total	16,916	10.0%	7,428	9.1%	9,488	10.8%
1	Los Angeles (8 SPAs)	3,342	9.8%	1,573	9.1%	1,769	10.5%
2	San Diego (6 HSRs)	1,636	9.7%	791	9.0%	845	10.3%
3	Orange	871	8.9%	514	8.6%	357	9.3%
4	Santa Clara	589	8.5%	422	9.0%	167	7.8%
5	San Bernardino	577	10.8%	208	9.0%	369	12.1%
6	Riverside	975	10.4%	353	9.4%	622	11.0%
7	Alameda	471	9.0%	180	7.2%	291	10.7%
8	Sacramento	563	8.4%	240	10.0%	323	7.5%
9	Contra Costa	479	8.9%	246	8.2%	233	9.8%
10	Fresno	341	10.2%	134	9.2%	207	11.0%
11	San Francisco	377	7.8%	234	7.8%	143	7.8%
12	Ventura	235	10.5%	84	8.2%	151	12.3%
13	San Mateo	282	8.3%	133	8.9%	149	8.0%
14	Kern	318	10.8%	114	9.3%	204	11.8%
15	San Joaquin	183	10.2%	70	8.3%	113	11.9%
16	Sonoma	163	10.4%	77	9.1%	86	12.2%
17	Stanislaus	235	8.8%	112	9.1%	123	8.6%
18	Santa Barbara	256	10.6%	89	10.4%	167	10.8%
19	Solano	263	8.2%	125	6.7%	138	9.9%
20	Tulare	199	12.5%	68	10.4%	131	14.1%
21	Santa Cruz	190	13.5%	65	11.6%	125	14.7%
22	Marin	200	8.5%	71	7.8%	129	9.0%
23	San Luis Obispo	130	19.4%	55	16.1%	75	22.2%
24	Placer	121	16.9%	47	11.8%	74	22.6%
25	Merced	239	10.3%	86	8.5%	153	11.4%
26	Butte	129	23.8%	48	22.2%	81	24.6%
27	Shasta	150	28.3%	53	27.3%	97	28.8%

(continued)

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

	Stratum <sup>3</sup>	Total		Advance letter mailed			
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Yes		No	
				Complete	Response rate (%)	Complete	Response rate (%)
28	Yolo	138	23.0%	49	17.2%	89	27.6%
29	El Dorado	154	24.4%	57	22.9%	97	25.3%
30	Imperial	248	10.4%	116	8.8%	132	11.7%
31	Napa	265	9.1%	91	9.1%	174	9.1%
32	Kings	249	9.8%	106	8.9%	143	10.5%
33	Madera	232	10.4%	57	10.7%	175	10.4%
34	Monterey	218	9.8%	72	7.6%	146	11.3%
35	Humboldt	152	28.7%	39	24.4%	113	30.4%
36	Nevada	198	9.0%	48	9.6%	150	8.8%
37	Mendocino	284	12.3%	66	14.8%	218	11.7%
38	Sutter	315	11.2%	170	12.1%	145	10.6%
39	Yuba	147	9.2%	147	9.2%	NA	
40	Lake	237	13.2%	57	12.6%	180	13.4%
41	San Benito	287	10.5%	78	8.2%	209	11.5%
42	Tehama, etc.	69	20.3%	28	21.9%	41	19.1%
43	Del Norte, etc.	99	25.6%	21	18.8%	78	28.0%
44	Tuolumne, etc.	110	11.6%	34	8.0%	76	14.7%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

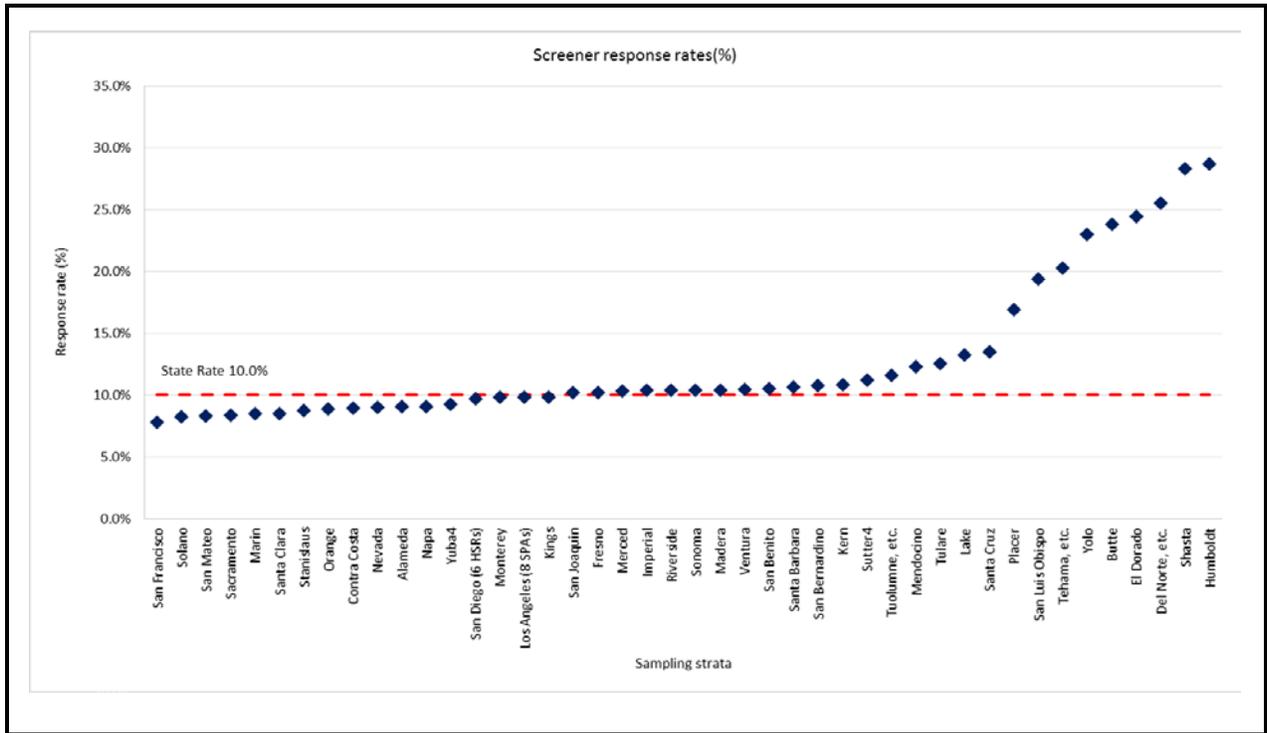
Note. Dividing line separates counties with a population of more than 500,000 persons as of January 1, 2016.

<sup>1</sup> A complete here includes any HH with a completed screening interview

<sup>2</sup> Response rate is calculated as the sum of completes and partial completes divided by the sum of eligible cases and unknown cases (adjusted by the eligibility rate).

<sup>3</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata

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



Response rates in the cell phone sample range from a low of 7.8 percent in San Francisco County to a high of 28.7 percent in Humboldt County. The state level cell phone sample screener response rate is 10.0 percent, which is about 3.2 percentage points lower 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 2017 Methodology Series: Report 2 – Data Collection Methods*, which presents a comparison of the final cell sample and landline sample screener dispositions in CHIS 2017.

## **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 10,151 households where either an adult, child or adolescent extended interview was completed, resulting in a statewide household level response rate of 70.3 percent. Additionally, 10,020 adult interviews, 512 interviews about children, and 211 adolescent interviews were completed in the landline and surname list samples.

The statewide adult response rate for the landline/surname list sample shown in Table 6-3 for the adult interview was 61.0 percent, an increase of 19.3 percentage points from CHIS 2015-2016. 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 57.4 percent, while for counties with less than 500,000 the median adult response rate is 61.4 percent. This difference may be attributable to a variety of reasons, for instance there are meaningful differences in the age breakdown, and education between respondents in the larger and smaller counties and these variables tend to be correlated with response rates. The 2017 child interview state level response rate was 63.3 percent, which is 6.3 percentage points higher than the child response rate observed in CHIS 2015-2016. The state level adolescent interview rate is 26.6 percent, which is 9 points higher than the rate observed in CHIS 2015-2016. We attribute lower screener rates and higher extended interview response rates as compared with 2015-2016 to the decision to move eligible screener completes without corresponding adult completes to CHIS 2018 for continued dialing attempts. As the response rates in Table 6-3 (as well as Table 6-4) are conditional on screener completes, the movement of screener completes without corresponding adult completes to 2018 serves to inflate the response rates for households, adults, teens and children.

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

Stratum <sup>3</sup>	Household		Adult		Child		Adolescent	
	Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
State total	10,151	70.3%	10,020	61.0%	512	63.3%	211	26.6%
1 Los Angeles (8 SPAs)	1,838	62.1%	1,817	56.2%	91	58.7%	41	27.0%
2 San Diego (6 HSRs)	1,159	72.3%	1,151	67.8%	53	63.8%	13	13.1%
3 Orange	730	63.4%	720	57.8%	30	66.1%	14	26.1%
4 Santa Clara	372	68.0%	364	63.3%	17	76.0%	14	35.0%
5 San Bernardino	328	57.6%	322	51.2%	24	74.5%	7	19.2%
6 Riverside	522	58.6%	513	53.0%	32	55.5%	13	31.9%
7 Alameda	270	65.4%	264	61.7%	17	79.2%	3	16.0%
8 Sacramento	266	67.6%	262	60.7%	10	62.9%	6	31.9%
9 Contra Costa	205	63.9%	201	57.4%	11	66.2%	6	35.3%
10 Fresno	186	60.3%	184	53.7%	7	57.0%	5	26.7%
11 San Francisco	184	76.8%	183	73.5%	9	65.5%	4	37.5%
12 Ventura	165	58.6%	163	53.6%	12	76.5%	3	21.2%
13 San Mateo	174	64.2%	172	58.4%	12	81.3%	5	25.1%
14 Kern	161	60.2%	160	55.0%	5	69.8%	3	32.4%
15 San Joaquin	109	58.9%	106	54.4%	10	64.0%	1	8.3%
16 Sonoma	99	70.6%	99	64.8%	3	42.9%	5	50.0%
17 Stanislaus	107	59.3%	106	52.4%	6	50.6%	1	28.6%
18 Santa Barbara	109	65.2%	107	59.7%	8	83.3%	5	46.7%
19 Solano	83	60.0%	79	52.9%	8	70.1%	2	14.4%
20 Tulare	97	69.0%	96	66.8%	5	66.7%	3	51.3%
21 Santa Cruz	113	73.3%	111	65.1%	7	81.8%	3	31.1%
22 Marin	129	67.8%	126	61.4%	6	87.5%	1	11.8%
23 San Luis Obispo	135	95.7%	135	94.0%	7	75.0%	7	68.8%
24 Placer	115	93.1%	115	90.7%	0	0.0%	3	62.5%
25 Merced	111	65.3%	107	58.5%	10	100.0%	1	9.1%
26 Butte	160	95.8%	159	94.3%	8	65.5%	1	6.4%
27 Shasta	197	94.2%	195	92.3%	7	47.6%	2	17.3%
28 Yolo	124	97.5%	123	95.3%	4	71.4%	2	17.3%

(continued)

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

	Stratum <sup>3</sup>	Household		Adult		Child		Adolescent	
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
29	El Dorado	118	95.9%	117	93.7%	7	67.1%	4	58.3%
30	Imperial	136	50.2%	134	44.4%	13	54.9%	7	26.9%
31	Napa	103	63.1%	103	58.2%	1	50.0%	3	51.4%
32	Kings	123	60.3%	120	53.2%	7	50.0%	1	6.9%
33	Madera	140	66.3%	138	62.9%	11	77.8%	1	22.2%
34	Monterey	80	59.4%	80	55.3%	2	66.7%	0	0.0%
35	Humboldt	192	94.1%	190	91.8%	6	87.5%	5	50.0%
36	Nevada	137	62.9%	137	58.9%	6	64.3%	0	0.0%
37	Mendocino	91	63.3%	89	57.4%	5	58.3%	0	0.0%
38	Sutter	134	62.1%	132	54.7%	8	47.8%	2	12.5%
39	Yuba	126	61.5%	121	56.3%	5	50.0%	1	13.9%
40	Lake	93	59.9%	92	56.6%	5	88.9%	4	63.5%
41	San Benito	120	60.5%	118	56.1%	8	38.7%	3	43.1%
42	Tehama, etc.	118	90.1%	118	88.1%	2	42.9%	1	8.4%
43	Del Norte, etc.	92	92.9%	92	91.7%	3	80.0%	2	50.0%
44	Tuolumne, etc.	100	92.6%	99	91.1%	4	100.0%	3	36.7%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

Note. Dividing line separates counties with a population of more than 500,000 persons as of January 1, 2016.

<sup>1</sup> A complete here includes any HH with any completed extended interview (adult, child, or teen) weighted by the HH weight

<sup>2</sup> Response rate is calculated as the sum of completes and partial completes divided by the sum of eligible cases and unknown cases (adjusted by the eligibility rate).

<sup>3</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata

Table 6-4 shows the household, adult, child, and adolescent extended interview response rate for the cell phone sample. There were 10,796 households where either an adult, child or adolescent extended interview was completed, resulting in a statewide household level response rate of 65.2 percent. Within stratum, there was a wide range of rates, with a low of 57.8 percent in Los Angeles to a high of 96.9 percent in the Del Norte etc. counties. 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. As shown in Table 6-4, the adult response rate is higher than the household response rate because of these weight variations.

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

	Stratum <sup>3</sup>	Household		Adult		Child		Adolescent	
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
	State total	10,796	65.2%	10,794	66.6%	1,046	63.9%	222	20.3%
1	Los Angeles (8 SPAs)	1,859	57.8%	1,858	58.0%	189	64.5%	46	22.2%
2	San Diego (6 HSRs)	1,023	65.5%	1,023	65.6%	99	69.1%	22	21.2%
3	Orange	549	66.3%	549	66.3%	46	59.3%	6	13.2%
4	Santa Clara	408	70.0%	408	70.6%	42	56.9%	8	16.4%
5	San Bernardino	328	60.1%	328	60.0%	32	56.5%	6	12.7%
6	Riverside	586	63.4%	586	63.5%	49	66.4%	13	18.0%
7	Alameda	282	61.9%	282	62.0%	38	74.3%	10	25.8%
8	Sacramento	373	69.9%	373	70.0%	31	69.5%	9	23.9%
9	Contra Costa	315	68.1%	315	68.2%	24	55.5%	4	16.7%
10	Fresno	210	65.5%	210	65.4%	20	63.6%	7	30.7%
11	San Francisco	267	73.6%	267	74.0%	37	71.6%	1	4.9%
12	Ventura	149	64.8%	149	64.8%	17	60.5%	1	8.5%
13	San Mateo	165	60.7%	165	60.8%	9	50.0%	6	31.9%
14	Kern	178	59.1%	178	59.2%	22	58.5%	5	19.2%
15	San Joaquin	116	66.3%	116	66.3%	9	60.7%	1	15.0%
16	Sonoma	118	73.9%	117	73.8%	13	56.6%	0	0.0%
17	Stanislaus	143	64.7%	143	64.7%	16	67.0%	1	5.3%
18	Santa Barbara	152	61.3%	152	61.3%	8	51.0%	4	29.5%
19	Solano	164	65.3%	164	65.6%	12	51.2%	3	18.0%
20	Tulare	138	74.0%	138	74.0%	13	48.1%	2	12.0%
21	Santa Cruz	138	75.4%	138	75.4%	8	40.7%	2	12.9%
22	Marin	120	63.6%	120	63.6%	9	61.5%	1	18.2%
23	San Luis Obispo	111	89.7%	111	89.7%	11	66.0%	3	24.1%
24	Placer	108	90.8%	108	90.8%	13	87.5%	0	0.0%
25	Merced	162	69.2%	162	70.3%	21	61.8%	2	8.5%

(continued)

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 <sup>3</sup>	Household		Adult		Child		Adolescent	
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
26	Butte	119	95.2%	119	95.2%	7	46.7%	2	46.8%
27	Shasta	139	96.5%	139	96.6%	17	87.3%	4	31.9%
28	Yolo	128	96.3%	128	96.3%	15	52.0%	3	34.2%
29	El Dorado	141	93.5%	141	93.5%	12	60.0%	3	22.2%
30	Imperial	140	59.6%	140	59.6%	16	54.3%	4	40.4%
31	Napa	175	67.8%	175	68.0%	11	77.8%	2	12.5%
32	Kings	168	70.3%	168	70.3%	24	71.7%	3	11.0%
33	Madera	149	65.8%	149	66.5%	24	71.0%	5	20.4%
34	Monterey	140	66.5%	140	66.5%	13	65.7%	2	12.8%
35	Humboldt	140	94.0%	140	94.0%	20	87.2%	7	62.7%
36	Nevada	135	71.5%	135	71.5%	9	80.0%	2	22.1%
37	Mendocino	191	70.2%	191	70.2%	16	71.7%	2	20.8%
38	Sutter	219	70.8%	219	71.5%	16	52.0%	1	9.3%
39	Yuba	94	66.8%	94	66.8%	9	76.2%	0	0.0%
40	Lake	150	67.3%	150	67.3%	16	71.6%	3	17.5%
41	San Benito	169	62.3%	169	62.5%	11	49.6%	8	32.0%
42	Tehama, etc.	63	92.7%	63	92.7%	7	76.9%	1	50.0%
43	Del Norte, etc.	94	96.9%	94	96.9%	10	65.7%	2	31.2%
44	Tuolumne, etc.	80	73.5%	80	73.5%	5	63.6%	5	53.8%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

Note. Dividing line separates counties with a population of more than 500,000 persons as of January 1, 2016.

<sup>1</sup> A complete here includes any HH with any completed extended interview (adult, child, or teen) weighted by the HH weight

<sup>2</sup> Response rate is calculated as the sum of completes and partial completes divided by the sum of eligible cases and unknown cases (adjusted by the eligibility rate).

<sup>3</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata

Additionally, 10,794 adult interviews, 1,046 interviews about children, and 222 adolescent interviews were completed in the cell phone sample. The statewide response rate for the adult interview was 66.6 percent. This represents an increase of 18.7 percentage points from CHIS 2015-2016. The cell phone child interview response rate was 63.9 percent, which is 16.6 points higher than the equivalent response rate observed CHIS 2015-2016. The cell phone sample adolescent response rate was 20.3 percent, which is 1.5 percentage points higher than the response rate observed in CHIS 2015-2016.

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. Results are shown separately for the combined landline and surname list samples and the cell sample. Overall, the cell response rate is 5.6 percentage points higher than that for the landline/surname list samples. One explanation for this difference is evident in the final two rows of Table 6-5: the landline/surname list response rate is about 10.4 points higher than the cell rate if the screener respondent is sampled, and about 29 points lower if another adult is sampled. For the cell sample, the screener respondent was always chosen to be the adult respondent. Since the response rate was dramatically lower when an adult other than the screener respondent was selected for the landline sample, the higher proportion of screener respondents selected as the sampled adult translates to a higher overall response rate for the cell sample.

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

Characteristic	Sample type response rate (%)	
	Landline/Surname list	Cell phone
Total	61.0%	66.6%
Sex		
Male	57.1%	66.2%
Female	64.1%	67.2%
Age		
18 to 30 years	36.0%	62.6%
31 to 45 years	47.2%	62.6%
46 to 65 years	60.3%	69.2%
Over 65 years	72.4%	77.1%
Type of household		
With somebody less than 18 years old	49.3%	60.2%
Without somebody less than 18 years old	64.5%	70.6%
Number of adults in household		
1	82.3%	69.0%
2	62.8%	68.4%
3 or more	47.0%	63.1%
Sampled adult was screener respondent		
Yes	77.0%	N/A
No	37.6%	N/A

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

Another notable difference in the response rate pattern between the landline/surname list and cell samples is by sampled adult gender. Women are traditionally more cooperative than men in landline and surname list samples, and this pattern is borne out in CHIS 2017. In contrast, this gender response gap is smaller in the cell sample (1.0 percent vs. 7.0 percent). Men also respond at a higher rate (66.2 percent) in the cell sample than in the landline/surname list sample (57.1 percent).

Older adults are also typically more cooperative than younger adults, and again this pattern is borne out in the landline/surname list sample, with a 36.4 percentage 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 14.5 percentage points.

In the landline/surname 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 63.3 percent for the landline/surname sample, which is 6.3 points higher than that in CHIS 2015-2016. The median rate in the more populous counties (60.7 %) is 5 points lower than the rate in smaller counties (65.7%). The statewide child-level response for the cell phone sample is 63.9 percent, which is 0.6 points higher than the response rate in the combined landline and surname samples, and 16.6 points higher than the rate for the cell phone child sample in CHIS 2015-2016.

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/surname list and cell phone samples. Note, child gender was missing for approximately 15% of sampled child cases, which results in a slightly higher child response rate for those cases where gender was provided compared with the total child response rate. *CHIS 2017 Methodology Series: Report 2 – Data Collection Methods* contains more detail on response to the child interview.

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

Characteristic	Sample type response rate (%)	
	Landline/Surname list	Cell phone
Total	63.3%	63.9%
Sex		
Male	65.7%	68.3%
Female	65.2%	67.7%
Number of children in household		
1	62.0%	65.0%
2	66.9%	61.7%
3	59.6%	68.3%
4 or more	57.6%	60.1%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

The last person-level response rates presented are for the adolescent interview. Recall that the adolescent could not be interviewed unless a parent or guardian gave verbal permission. 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 much 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 26.6 percent. If we exclude nonresponse due to parents not giving permission, the landline cooperation rate rises to 84.0 percent (see Table 6-8). Similarly, the state-level adolescent response rate in the cell phone sample is 20.3 percent while the cell phone adolescent cooperation is 69.3 percent if the nonresponse due to parents not giving permission is excluded.

Table 6-7 gives the landline and cell phone adolescent response rates by the gender characteristics of the adolescent and household based on data collected in the adult interview or screener. There is also some minor difference between the landline/surname list and cell samples in gender distribution.

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

Characteristic	Sample type response rate (%)	
	Landline/Surname list	Cell phone
Total	26.6%	20.3%
Sex		
Male	26.5%	21.7%
Female	28.7%	21.1%

Source: UCLA Center for Health Policy Research, 2017 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/Surname list	Cell phone
Total	84.0%	69.3%
Sex		
Male	81.4%	65.1%
Female	86.8%	74.4%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

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 like 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 14.7 points higher for the landline/surname list sample than for the cell sample.

Differences in response rates can lead to nonresponse bias as suggested by the formula presented in Chapter 2 for the bias attributable to nonresponse. To reduce this potential for bias, geographic and demographic characteristics examined in Tables 6-1 through 6-8 were taken into account in developing the weights as described in *CHIS 2017 Methodology Series: Report 5 – Weighting and Variance Estimation*. For example, nonresponse adjustments were done separately by county, thus accounting for the differences in response rates noted above by the size and urbanicity of the counties. In addition, the weights were also adjusted to be consistent with data from the control totals to reduce residual biases.

### 6.3 Overall Response Rates

This section presents the overall, or unconditional, response rates for the household and for the adult, child, and adolescent interviews for the different samples in CHIS 2017. Table 6-9 gives these response rates for the entire state and by county for the combined landline/surname list sample. As discussed in Chapter 5 (Response Rates), 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 (5-6). The adult response rates are computed using equation (5-7). The child and adolescent overall rates are computed using equations (5-8) and (5-9), respectively.

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

Stratum <sup>2</sup>	Interview type overall response rate (%) <sup>1</sup>			
	Household	Adult	Child	Adolescent
State total	9.3%	8.1%	8.4%	3.5%
1 Los Angeles (8 SPAs)	7.1%	6.5%	6.8%	3.1%
2 San Diego (6 HSRs)	9.1%	8.5%	8.0%	1.6%
3 Orange	7.0%	6.3%	7.3%	2.9%
4 Santa Clara	5.8%	5.4%	6.5%	3.0%
5 San Bernardino	6.9%	6.1%	8.9%	2.3%
6 Riverside	5.7%	5.1%	5.3%	3.1%
7 Alameda	7.0%	6.6%	8.5%	1.7%
8 Sacramento	8.1%	7.2%	7.5%	3.8%
9 Contra Costa	6.0%	5.4%	6.2%	3.3%
10 Fresno	7.1%	6.4%	6.7%	3.2%
11 San Francisco	5.9%	5.6%	5.0%	2.9%
12 Ventura	7.4%	6.7%	9.6%	2.7%
13 San Mateo	6.2%	5.6%	7.8%	2.4%
14 Kern	7.2%	6.5%	8.3%	3.9%
15 San Joaquin	7.0%	6.4%	7.6%	1.0%
16 Sonoma	9.6%	8.8%	5.8%	6.8%
17 Stanislaus	6.9%	6.1%	5.9%	3.3%
18 Santa Barbara	8.2%	7.5%	10.4%	5.9%
19 Solano	6.4%	5.7%	7.5%	1.5%
20 Tulare	12.5%	12.1%	12.1%	9.3%

(continued)

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

	Stratum <sup>2</sup>	Interview type overall response rate (%) <sup>1</sup>			
		Household	Adult	Child	Adolescent
21	Santa Cruz	11.9%	10.5%	13.3%	5.0%
22	Marin	5.4%	4.9%	7.0%	0.9%
23	San Luis Obispo	46.2%	45.3%	36.2%	33.1%
24	Placer	32.7%	31.8%	0.0%	21.9%
25	Merced	7.9%	7.0%	12.0%	1.1%
26	Butte	40.2%	39.5%	27.4%	2.7%
27	Shasta	43.6%	42.7%	22.0%	8.0%
28	Yolo	46.7%	45.7%	34.2%	8.3%
29	El Dorado	31.2%	30.5%	21.9%	19.0%
30	Imperial	7.4%	6.5%	8.1%	4.0%
31	Napa	9.6%	8.8%	7.6%	7.8%
32	Kings	7.5%	6.6%	6.2%	0.9%
33	Madera	11.0%	10.5%	12.9%	3.7%
34	Monterey	4.5%	4.2%	5.1%	0.0%
35	Humboldt	52.9%	51.6%	49.2%	28.1%
36	Nevada	8.9%	8.4%	9.1%	0.0%
37	Mendocino	10.8%	9.8%	10.0%	0.0%
38	Sutter	8.3%	7.3%	6.4%	1.7%
39	Yuba	8.2%	7.5%	6.7%	1.8%
40	Lake	10.1%	9.5%	14.9%	10.7%
41	San Benito	7.0%	6.5%	4.5%	5.0%
42	Tehama, etc.	37.8%	36.9%	18.0%	3.5%
43	Del Norte, etc.	39.0%	38.4%	33.5%	21.0%
44	Tuolumne, etc.	35.0%	34.4%	37.8%	13.9%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

<sup>1</sup> 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).

<sup>2</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata

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/surname list adult response rate in CHIS 2017 is very similar to the overall landline/surname list adult response rate in CHIS 2015-2016.

Table 6-10 shows the overall response rate for the cell phone sample. The lowest adult response rate was in San Mateo County (5.0 percent) while the highest was in Shasta County (27.4 percent). The

overall adult response rate was 6.6 percent, which is about 1.9 percentage point lower than the overall 8.5 percent rate that was observed for adults in the landline/surname list sample. This is also 2.8 points lower than the overall cell adult response rate in CHIS 2015-2016.

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

	Stratum <sup>2</sup>	Interview type overall response rate (%) <sup>1</sup>			
		Household	Adult	Child	Adolescent
	State total	6.5%	6.6%	6.4%	2.0%
1	Los Angeles (8 SPAs)	5.7%	5.7%	6.3%	2.2%
2	San Diego (6 HSRs)	6.3%	6.3%	6.7%	2.0%
3	Orange	5.9%	5.9%	5.3%	1.2%
4	Santa Clara	6.0%	6.0%	4.8%	1.4%
5	San Bernardino	6.5%	6.5%	6.1%	1.4%
6	Riverside	6.6%	6.6%	6.9%	1.9%
7	Alameda	5.6%	5.6%	6.7%	2.3%
8	Sacramento	5.9%	5.9%	5.8%	2.0%
9	Contra Costa	6.1%	6.1%	5.0%	1.5%
10	Fresno	6.7%	6.7%	6.5%	3.1%
11	San Francisco	5.7%	5.8%	5.6%	0.4%
12	Ventura	6.8%	6.8%	6.3%	0.9%
13	San Mateo	5.0%	5.1%	4.2%	2.7%
14	Kern	6.4%	6.4%	6.3%	2.1%
15	San Joaquin	6.8%	6.8%	6.2%	1.5%
16	Sonoma	7.7%	7.7%	5.9%	0.0%
17	Stanislaus	5.7%	5.7%	5.9%	0.5%
18	Santa Barbara	6.5%	6.5%	5.4%	3.1%
19	Solano	5.4%	5.4%	4.2%	1.5%
20	Tulare	9.3%	9.3%	6.0%	1.5%
21	Santa Cruz	10.2%	10.2%	5.5%	1.7%
22	Marin	5.4%	5.4%	5.2%	1.5%
23	San Luis Obispo	17.4%	17.4%	12.8%	4.7%
24	Placer	15.4%	15.4%	14.8%	0.0%
25	Merced	7.1%	7.2%	6.4%	0.9%
26	Butte	22.7%	22.7%	11.1%	11.1%
27	Shasta	27.4%	27.4%	24.7%	9.0%
28	Yolo	22.1%	22.1%	12.0%	7.9%
29	El Dorado	22.8%	22.8%	14.7%	5.4%
30	Imperial	6.2%	6.2%	5.6%	4.2%

(continued)

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

	Stratum <sup>2</sup>	Interview type overall response rate (%) <sup>1</sup>			
		Household	Adult	Child	Adolescent
31	Napa	6.1%	6.2%	7.0%	1.1%
32	Kings	6.9%	6.9%	7.0%	1.1%
33	Madera	6.8%	6.9%	7.4%	2.1%
34	Monterey	6.5%	6.5%	6.4%	1.3%
35	Humboldt	27.0%	27.0%	25.0%	18.0%
36	Nevada	6.4%	6.4%	7.2%	2.0%
37	Mendocino	8.6%	8.6%	8.8%	2.6%
38	Sutter	7.9%	8.0%	5.8%	1.0%
39	Yuba	6.2%	6.2%	7.0%	0.0%
40	Lake	8.9%	8.9%	9.5%	2.3%
41	San Benito	6.5%	6.6%	5.2%	3.4%
42	Tehama, etc.	18.8%	18.8%	15.6%	10.1%
43	Del Norte, etc.	24.8%	24.8%	16.8%	8.0%
44	Tuolumne, etc.	8.5%	8.5%	7.4%	6.3%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

<sup>1</sup> 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).

<sup>2</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata

Table 6-11 summarizes the overall response rates by sample types. The cell phone sample has lower overall response rates than landline and surname samples. The overall response rates for the cell sample are lower than the rates observed in CHIS 2015-2016 and it follows the trends of response rates in telephone surveys in the U.S.

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

Sample type	Overall response rate (%) <sup>1</sup>			
	Household	Adult	Child	Adolescent
Landline/surname list	9.3%	8.1%	8.4%	3.5%
Cell phone	6.5%	6.6%	6.4%	2.0%
Landline/surname list/cell-phone	7.1%	6.7%	6.7%	2.4%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

<sup>1</sup> 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).

## 7. DISCUSSION OF RESPONSE RATES

This chapter presents a discussion of the response rates obtained in CHIS 2017, including procedures used to increase response rates and comparison of these rates with other telephone surveys. The first section briefly reviews some of the methods used in CHIS 2017 that effect response rates. A more complete discussion of these data collection methods is provided in *CHIS 2017 Methodology Series: Report 2 – Data Collection Methods*.

### 7.1 Methods to Enhance Response Rates

Several methods to enhance response rates have been used across previous CHIS cycles. Methods for enhancing response rates in CHIS 2017 included:

- **Repeated call attempts:** Most interviews were completed within the first few call attempts to a sample number, but the procedures implemented in CHIS 2017 allowed for 14 calls when no contact had been made previously. These additional attempts were intended to maximize response rates among sample members who were less likely to answer phone calls from unknown callers. This procedure also has the potential to reduce nonresponse bias from this source of nonresponse by including at least some sample members who require more than a few call attempts to reach.
- **Recontacting initial refusals:** The refusal conversion protocol is described for landline and cell phone sample in Chapter 4.
- **Proxy reporting:** As in previous cycles, proxy respondents could report for sampled adults when the sampled adult was unable to answer for himself/herself due to illness or impairment. As indicated in Section 4.1, in CHIS 2017, a total of 3 adult proxy interviews were completed. Proxy respondents had to be adult household members who were knowledgeable about the sampled person's health. The proxy respondent was typically a spouse or an adult child of the sampled adult. While the number of interviews completed using the proxy interviews is relatively small, the proxy interviews add responses from adults who would otherwise be excluded from the survey and who likely have very different health characteristics than other adult respondents.
- **Advance letter:** Another method used to increase response rates was mailing an introductory letter in advance to all landline and surname list sampled cases with mailable addresses provided by sample vendors. In a departure from previous years, CHIS 2017 also mailed an introductory letter in advance to all cell sampled cases with mailable addresses provided by

sample vendors. The advance letter mailing appears to have increased response rates slightly overall with the advance letter mailing being much more effective for mailable landline cases than mailable cell cases (see Tables 6-1 and 6-2). While no experimental data exist to support the effect of mailings in CHIS 2017, 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

Type	Response rate (%)		
	Advance letter mailed		Difference (%)
	Yes	No	
Screener	12.0%	10.5%	1.5%
Adult interview	64.0%	61.7%	2.3%
Child interview	64.6%	63.0%	1.6%
Adolescent interview	25.5%	20.0%	5.5%
Household extended	69.30%	63.80%	5.5%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

- In-language interviews:** A very important procedure incorporated to enhance the response rates was conducting the interviews in the language requested by the sampled person. The languages included in 2017 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 these additional languages not been offered to sample members. In addition, the quality of the screener and extended interview data are likely better for these households than if they had been only allowed to respond in English. Table 7-2 gives the number of interviews that were completed by language. More than 3,400 households completed the screener using a language other than English, accounting for about 10 percent of all the completed screener interviews in CHIS 2017. Spanish was the most frequently used language, with 96 percent of the non-English screener interviews being completed in Spanish. Vietnamese was the second most frequently used language in the interviews.

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

Interview type	Non-English						Total	Total
	English	Spanish	Vietnamese	Korean	Chinese	Tagalog		
<b>Screeners Interviews</b>								
Total	30,202	3,369	56	33	50	4	3,512	33,714
Landline	14,770	957	8	6	14	1	986	15,756
Cell phone sample	14,598	2,146	26	12	18	3	2,205	16,803
Korean surname	210	4	0	14	13	0	31	241
Vietnamese surname	140	2	22	1	5	0	30	170
Imperial County	484	260	0	0	0	0	260	744
<b>Adult Interviews</b>								
Total	19,517	1,512	51	27	44	1	1,635	21,152
Landline	9,444	365	8	5	10	0	388	9,832
Cell phone sample	9,622	1,049	22	9	17	1	1,098	10,720
Korean surname	128	0	0	12	12	0	24	152
Vietnamese surname	82	0	21	1	5	0	27	109
Imperial County	241	98	0	0	0	0	98	339
<b>Child Interviews</b>								
Total	1,382	214	1	0	3	0	218	1,600
Landline	455	43	0	0	1	0	44	499
Cell phone sample	885	153	1	0	0	0	154	1,039
Korean surname	8	0	0	0	2	0	2	10
Vietnamese surname	10	0	0	0	0	0	0	10
Imperial County	24	18	0	0	0	0	18	42
<b>Teen Permission Interviews</b>								
Total	559	61	1	0	0	0	62	621
Landline	251	16	0	0	0	0	16	267
Cell phone sample	282	38	1	0	0	0	39	321
Korean surname	8	0	0	0	0	0	0	8
Vietnamese surname	5	0	0	0	0	0	0	5
Imperial County	13	7	0	0	0	0	7	20
<b>Teen Interviews</b>								
Total	413	34	1	0	0	0	35	448
Landline	195	11	0	0	0	0	11	206
Cell phone sample	199	19	1	0	0	0	20	219
Korean surname	3	0	0	0	0	0	0	3
Vietnamese surname	5	0	0	0	0	0	0	5
Imperial County	11	4	0	0	0	0	4	15

Source: UCLA Center for Health Policy Research, 2017 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 2017 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 Figures 7-1 and 7-2. The state-level response rates for the landline/surname list sample have been declining steadily since the first cycle of CHIS in 2001. The screener response rate decreased 7.4 points, or about 36 percent, between 2015-2016 and 2017 in the landline/surname list sample, and 9.6 points, or about 49 percent, in the cell phone sample. Note again, we attribute the dramatic lower screener rates and higher extended unconditional interview response rates as compared with 2015-2016 to the decision to move eligible screener completes without corresponding adult completes to CHIS 2018 for continued dialing attempts.

Table 7-3. Comparison of state-level response rates for the landline/surname list and cell phone sample from CHIS 2001 to 2017

Type	CHIS cycle response rate (%)								
	2001	2003	2005	2007	2009	2011-2012	2013-2014	2015-2016	2017
Landline/surname list sample									
Screener	59.2	55.9	49.8	35.6	36.1	31.6	28.8	20.6	13.2
Extended interviews									
Household	-	-	59.3	59.4	54.7	53.9	51.4	43.6	70.3
Adult	63.7	59.9	54.0	52.8	49.0	47.4	44.8	41.5	61.0
Child	87.6	81.4	75.2	73.7	72.9	73.2	68.9	57.0	63.3
Adolescent	63.5	57.3	48.5	44.1	42.8	42.7	40.2	17.6	26.6
Adolescent w/ parental permission	84.5	83.3	77.5	74.7	75.1	74.0	73.9	56.5	84.0
Overall landline/surname list									
Household	-	-	29.6	21.1	19.7	17.0	14.8	9.0	9.3
Adult	37.7	33.5	26.9	18.7	17.7	15.0	12.9	8.5	8.1
Child	33.0	27.3	25.2	16.8	15.7	13.8	11.0	11.7	8.4
Adolescent	23.9	19.2	14.2	10.2	7.9	6.7	5.3	3.6	3.5

(continued)

Table 7-3. Comparison of state-level response rates for the landline/surname list and cell phone sample from CHIS 2001 to 2017 (continued)

Type	CHIS cycle response rate (%)								
	2001	2003	2005	2007	2009	2011- 2012	2013- 2014	2015- 2016	2017
Cell phone sample									
Screener	-	-	-	-	19.3	33.0	30.7	19.6	10.0
Extended interviews									
Household	-	-	-	-	57.6	55.5	53.9	45.7	65.2
Adult	-	-	-	-	56.2	53.8	52.1	47.9	66.6
Child	-	-	-	-	76.0	73.4	72.2	47.3	63.9
Adolescent	-	-	-	-	46.4	42.6	41.0	18.8	20.3
Adolescent w/ parental permission	-	-	-	-	75.6	69.9	69.7	61.2	69.3
Overall cell phone									
Household	-	-	-	-	11.1	18.3	16.6	8.9	6.5
Adult	-	-	-	-	10.8	17.8	16.0	9.4	6.6
Child	-	-	-	-	8.2	13.0	11.5	9.3	6.4
Adolescent	-	-	-	-	5.0	7.6	6.6	3.7	2.0
Combined landline/ surname list and cell phone sample									
Household	-	-	-	-	17.4	17.7	16.0	8.9	7.1
Adult	-	-	-	-	15.6	16.5	15.0	9.1	6.7
Child	-	-	-	-	14.1	13.3	11.4	9.7	6.7
Adolescent	-	-	-	-	7.5	7.1	6.1	3.7	2.4

Source: UCLA Center for Health Policy Research, 2017 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)

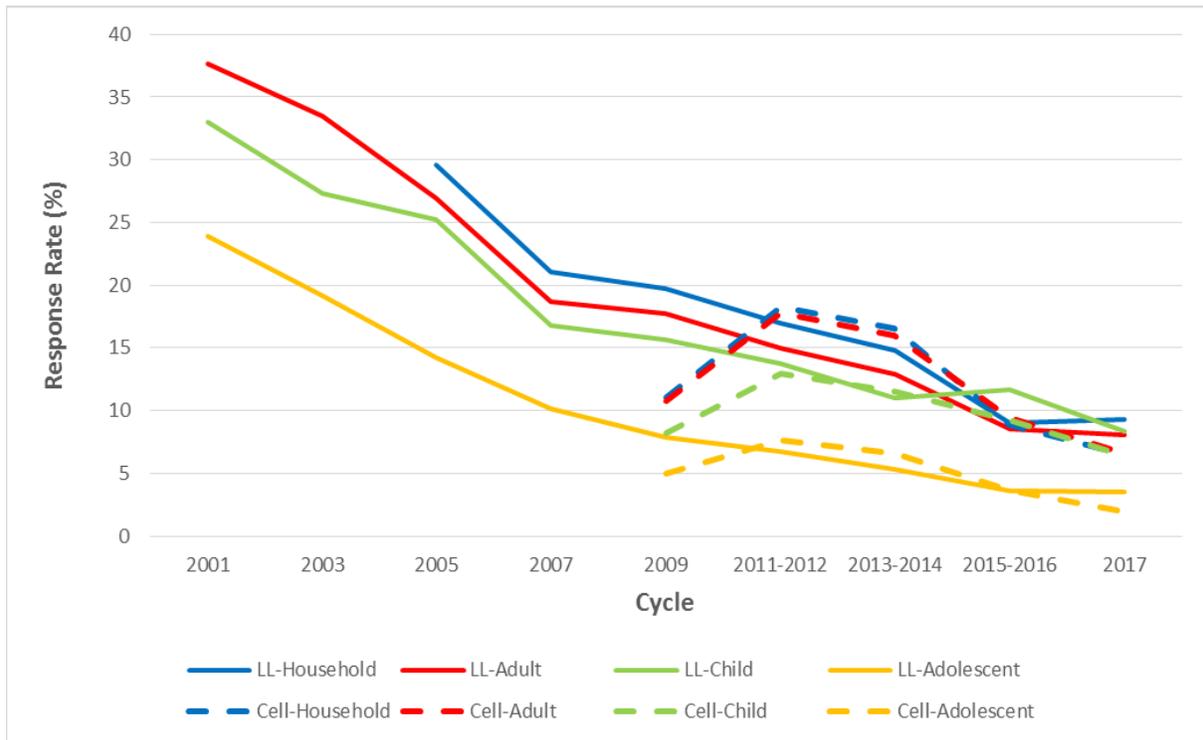
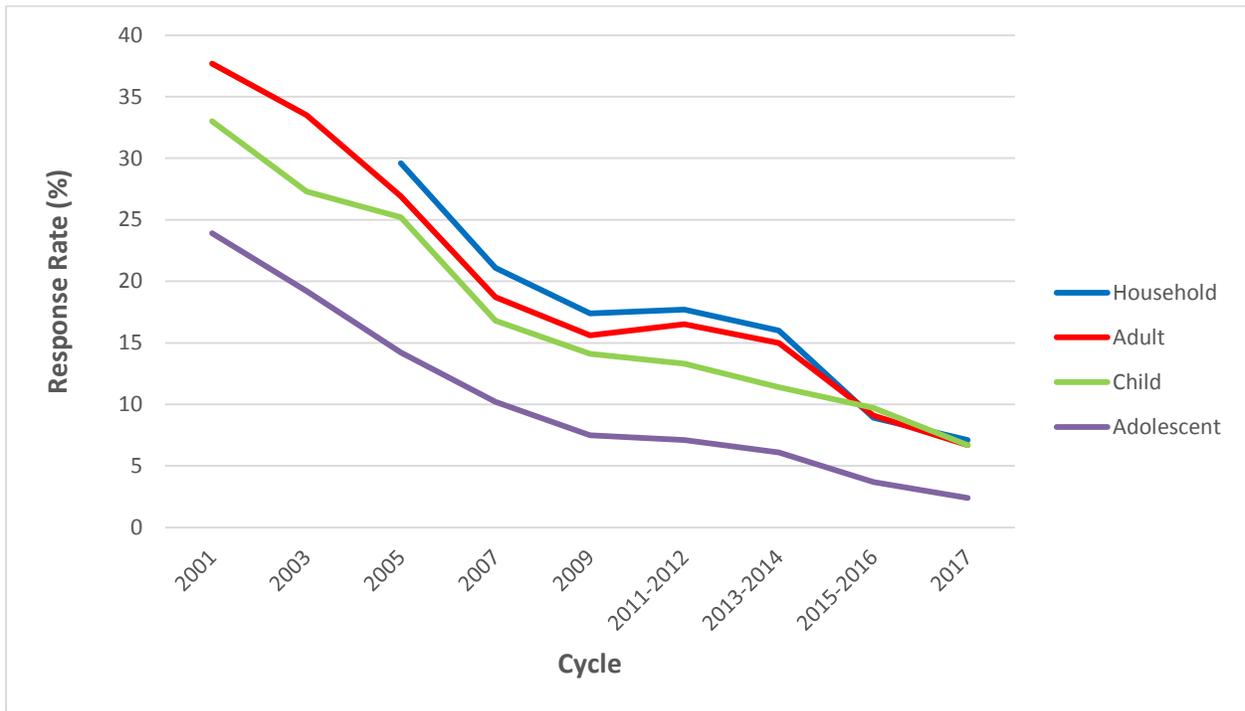


Figure 7-2. CHIS overall response rates by type of interview (adult, child, and adolescent)



### 7.3 Comparisons of Response Rates with Other Telephone Surveys

This section compares the response rates from CHIS 2017 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 involves 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, 2016) are attempts to address this problem. This section compares two RDD surveys conducted in California between 2016 and 2017.

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 2017 BRFSS and its data quality report with response rates is available from the CDC web site ([https://www.cdc.gov/brfss/annual\\_data/2017/pdf/2017-sdqr-508.pdf](https://www.cdc.gov/brfss/annual_data/2017/pdf/2017-sdqr-508.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 2017 and does not have multiple interviews within the household. Nonetheless, it is probably more like CHIS than any other survey for which detailed response rate information is available.

The 2017 BRFSS Summary Data Quality Report with Response Rates (Centers for Disease Control and Prevention, 2018) 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 2017 California BRFSS disposition codes unambiguously to the corresponding disposition codes used in CHIS 2017 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.

One difference between the CHIS and BRFSS disposition classification systems is the definition of a “partial interview.” Each survey’s response rates include partial interviews per the survey’s own definition. The BRFSS definition appears to include many more cases than does the CHIS definition. The 2017 report does not distinguish between partial and full interviews. CHIS cycles have maintained a

consistent rate of about 0.5 percent partial interviews. If this difference were taken into account, then the CHIS response rates would likely be higher, or the BRFSS rates would be lower.

The 2017 BRFSS Summary Data Quality Report includes AAPOR response rate 4 for the landline, cell phone, and combined samples. This rate, which is closest to the definition used in CHIS, is the overall response rate. However the overall response rates for the 2017 California BRFSS for landline and cell phone samples are over 20 percentage points higher than the response rates reported for CHIS 2017 as detailed in the previous sections. It is essential to emphasize that the BRFSS and CHIS overall response rates are not comparable because of the numerous differences in the design and calculations.

In previous cycles, attempts have been made to create more comparable response rates to BRFSS (for example, see *CHIS 2013-2014 Methodology Series: Report 4 – Response Rates*). These comparable measures have historically found that CHIS achieves a similar response rate to BRFSS. No attempt to create comparable response rates is done here. Given similar declines in response rates for both BRFSS and CHIS over recent years, we assume that CHIS continues to maintain a similar response rate to BRFSS.

## 8. REFERENCES

- Brick, J. M. (2013). Unit nonresponse and weighting adjustments: A critical review. *Journal of Official Statistics*, 29, pp. 329-353.
- Centers for Disease Control and Prevention. (2018). *Behavioral Risk Factor Surveillance System: 2017 Summary Data Quality Report*. Retrieved October 10, 2018, from [https://www.cdc.gov/brfss/annual\\_data/2017/pdf/2017-sdqr-508.pdf](https://www.cdc.gov/brfss/annual_data/2017/pdf/2017-sdqr-508.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 rate changes on the index of consumer sentiment. *Public Opinion Quarterly*, 64, 413-428.
- Groves, R. (2006). Nonresponse rates and nonresponse bias in household surveys. *Public Opinion Quarterly*, 70, 646-675.
- Groves, R. and Peytcheva, E. (2008). The impact of nonresponse rates on nonresponse bias. *Public Opinion Quarterly*, 72, 167-189.
- Groves, R. M., Singer, E., & Corning, A. (2000). Leverage-salience theory of survey participation: Description and an illustration. *Public Opinion Quarterly*, 64, 288-308.
- Hansen, M. H. and Hurwitz, W. N. (1946). The problem of non-response in sample surveys. *Journal of the American Statistical Association*, 41, 517-529.
- Keeter, S., Miller, C., Kohut, A., Groves, R., & Presser, S. (2000). Consequences of reducing nonresponse in a national telephone survey. *Public Opinion Quarterly*, 64, 125-148.
- Lessler, J. & Kalsbeek, W. (1992). *Nonsampling errors in surveys*. New York: John Wiley and Sons.
- McCarty, C. (2003). Differences in response rates using most recent versus final dispositions in telephone surveys. *Public Opinion Quarterly*, 67, 396-406.
- Peytchev, A. (2013). Consequences of survey nonresponse. *The Annals of the American Academy of Political and Social Science*, 645, 88-111.

- Peytchev, A., Baxter, R. K., and Carley-Baxter, L. R. (2009). Not all survey effort is equal: Reduction of nonresponse bias and nonresponse error. *Public Opinion Quarterly*, 73, 785-806.
- Rosen, J. A., Murphy, J., Peytchev, A., Holder, T., Dever, J. A., Herget, D. R., & Pratt, D. J. (2014). Prioritizing low-propensity sample members in a survey: Implications for nonresponse bias. *Survey Practice*, 7(1).
- 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. (2016). *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 9th edition.* AAPOR.
- Valliant, R., Dever, J. A., & Kreuter, F. (2013). *Practical tools for designing and weighting sample surveys.* New York: Springer.
- Wagner, J. (2012). A comparison of alternative indicators for the risk of nonresponse bias. *Public Opinion Quarterly*, 76, 555-575.

## **APPENDIX A**

Appendix A contains supplemental tables which report on the response rates combining across the landline/list and cell sample frames

Table A-1 reports on the number of completed screeners and screener response rates by sampling stratum and whether an advanced letter was sent or not for the combined, landline/surname list and cell, sample

Table A-2 reports on the number of completed extended interviews and response rates by sampling stratum and type of interview for the combined, landline/surname list sample (conditional on completed screener) and cell, sample

Table A-3 reports on the overall response rates by sampling stratum and type of interview for the combined, landline/surname list and cell, sample

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

	Stratum <sup>3</sup>	Advance letter mailed					
		Total		Yes		No	
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)
	State total	32,970	11.0%	19,927	11.2%	13,043	10.1%
1	Los Angeles (8 SPAs)	6,479	9.9%	4,170	10.0%	2,309	9.8%
2	San Diego (6 HSRs)	3,300	9.9%	2,021	10.0%	1,279	9.9%
3	Orange	2,091	9.1%	1,460	9.3%	631	8.9%
4	Santa Clara	1,162	8.4%	895	9.8%	267	6.6%
5	San Bernardino	1,182	10.8%	667	10.0%	515	11.5%
6	Riverside	1,923	10.0%	1159	10.2%	764	9.8%
7	Alameda	910	9.2%	501	8.7%	409	9.8%
8	Sacramento	974	9.4%	549	13.0%	425	7.1%
9	Contra Costa	822	9.1%	522	10.4%	300	7.7%
10	Fresno	666	10.6%	380	11.3%	286	10.1%
11	San Francisco	624	7.5%	423	8.5%	201	6.6%
12	Ventura	535	10.6%	335	9.6%	200	11.7%
13	San Mateo	564	8.6%	340	9.8%	224	7.6%
14	Kern	596	11.0%	339	11.6%	257	10.6%
15	San Joaquin	378	10.5%	211	10.4%	167	10.9%
16	Sonoma	311	11.4%	194	13.3%	117	9.8%
17	Stanislaus	422	9.5%	265	11.3%	157	7.9%
18	Santa Barbara	431	11.1%	225	13.8%	206	9.4%
19	Solano	405	8.8%	230	8.9%	175	8.9%
20	Tulare	349	13.1%	188	12.9%	161	13.4%
21	Santa Cruz	355	14.4%	194	15.9%	161	13.3%
22	Marin	403	8.2%	215	10.3%	188	7.1%
23	San Luis Obispo	278	30.1%	186	33.8%	92	23.4%
24	Placer	249	23.0%	150	23.8%	99	21.5%
25	Merced	421	10.6%	219	10.5%	202	10.8%
26	Butte	300	30.7%	176	35.3%	124	26.0%
27	Shasta	366	34.9%	211	39.1%	155	31.0%
28	Yolo	267	33.3%	156	36.3%	111	28.6%
29	El Dorado	280	28.9%	154	34.1%	126	23.1%

(continued)

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

Stratum <sup>3</sup>	Total		Advance letter mailed				
	Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Yes		No		
			Complete	Response rate (%)	Complete	Response rate (%)	
30	Imperial	545	11.0%	368	10.8%	177	11.3%
31	Napa	441	10.3%	221	12.5%	220	9.0%
32	Kings	466	10.2%	268	10.8%	198	9.9%
33	Madera	455	12.2%	203	16.9%	252	10.5%
34	Monterey	362	9.0%	183	9.6%	179	8.7%
35	Humboldt	357	41.0%	210	49.2%	147	32.2%
36	Nevada	423	11.5%	212	16.7%	211	8.6%
37	Mendocino	439	13.8%	154	18.7%	285	12.1%
38	Sutter	542	11.7%	344	13.7%	198	10.0%
39	Yuba	371	12.5%	290	14.2%	81	10.5%
40	Lake	399	14.9%	152	19.1%	247	12.9%
41	San Benito	498	10.6%	248	10.2%	250	10.8%
42	Tehama, etc.	204	32.5%	138	38.9%	66	23.1%
43	Del Norte, etc.	203	34.3%	85	40.1%	118	30.1%
44	Tuolumne, etc.	222	22.5%	116	27.2%	106	18.0%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

Note. Dividing line separates counties with a population of more than 500,000 persons as of January 1, 2016.

<sup>1</sup> A complete here includes any HH with a completed screening interview

<sup>2</sup> Response rate is calculated as the sum of completes and partial completes divided by the sum of eligible cases and unknown cases (adjusted by the eligibility rate).

<sup>3</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata

Table A-2. Number of completed extended interviews and response rates by sampling stratum and type of interview for the combined, landline/surname list sample and cell, sample (conditional on completed screener)

	Stratum <sup>3</sup>	Household		Adult		Child		Adolescent	
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
	State total	20,947	66.8%	20,814	63.0%	1,558	63.7%	433	23.4%
1	Los Angeles (8 SPAs)	3,697	58.8%	3,675	56.9%	280	62.5%	87	24.3%
2	San Diego (6 HSRs)	2,182	67.1%	2,174	67.0%	152	67.2%	35	17.5%
3	Orange	1,279	65.7%	1,269	60.1%	76	62.0%	20	20.5%
4	Santa Clara	780	69.4%	772	65.9%	59	60.9%	22	25.3%
5	San Bernardino	656	59.6%	650	54.1%	56	62.7%	13	15.5%
6	Riverside	1,108	62.3%	1,099	56.7%	81	61.9%	26	23.5%
7	Alameda	552	62.8%	546	61.9%	55	75.7%	13	22.7%
8	Sacramento	639	69.0%	635	64.6%	41	67.7%	15	26.2%
9	Contra Costa	520	66.3%	516	62.1%	35	58.5%	10	24.9%
10	Fresno	396	63.9%	394	57.9%	27	61.0%	12	28.7%
11	San Francisco	451	74.4%	450	73.7%	46	70.3%	5	19.1%
12	Ventura	314	63.5%	312	57.0%	29	65.6%	4	14.1%
13	San Mateo	339	62.1%	337	59.2%	21	64.9%	11	29.0%
14	Kern	339	59.4%	338	56.5%	27	60.5%	8	23.1%
15	San Joaquin	225	64.1%	222	58.4%	19	62.4%	2	10.5%
16	Sonoma	217	72.6%	216	68.4%	16	54.2%	5	26.2%
17	Stanislaus	250	62.8%	249	57.1%	22	60.8%	2	13.6%
18	Santa Barbara	261	62.7%	259	60.5%	16	65.0%	9	36.3%
19	Solano	247	63.4%	243	58.8%	20	56.7%	5	16.9%
20	Tulare	235	72.9%	234	69.8%	18	51.6%	5	28.6%
21	Santa Cruz	251	74.5%	249	69.1%	15	53.9%	5	19.6%
22	Marin	249	65.4%	246	62.2%	15	66.8%	2	14.7%
23	San Luis Obispo	246	93.3%	246	92.6%	18	69.2%	10	45.8%
24	Placer	223	91.9%	223	90.8%	13	77.8%	3	28.2%
25	Merced	273	68.2%	269	63.6%	31	67.6%	3	8.7%
26	Butte	279	95.5%	278	94.6%	15	56.6%	3	24.6%
27	Shasta	336	95.4%	334	93.5%	24	69.3%	6	26.4%
28	Yolo	252	97.0%	251	95.7%	19	55.7%	5	26.7%

(continued)

Table A-2. Number of completed extended interviews and response rates by sampling stratum and type of interview for the combined, landline/surname list sample and cell, sample (conditional on completed screener)

	Stratum <sup>3</sup>	Household		Adult		Child		Adolescent	
		Complete <sup>1</sup>	Response rate <sup>2</sup> (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
29	El Dorado	259	95.0%	258	93.6%	19	62.3%	7	36.7%
30	Imperial	276	57.6%	274	48.9%	29	54.8%	11	31.6%
31	Napa	278	66.3%	278	62.7%	12	75.6%	5	25.5%
32	Kings	291	67.8%	288	59.6%	31	65.2%	4	9.8%
33	Madera	289	66.0%	287	64.2%	35	72.7%	6	20.7%
34	Monterey	220	64.3%	220	60.4%	15	66.5%	2	7.9%
35	Humboldt	332	94.1%	330	92.5%	26	87.2%	12	57.0%
36	Nevada	272	66.4%	272	63.0%	15	72.4%	2	13.1%
37	Mendocino	282	67.4%	280	64.1%	21	68.4%	2	15.0%
38	Sutter	353	68.8%	351	61.7%	24	50.4%	3	11.0%
39	Yuba	220	62.4%	215	59.1%	14	66.2%	1	7.1%
40	Lake	243	63.2%	242	61.3%	21	75.6%	7	32.0%
41	San Benito	289	61.8%	287	58.8%	19	43.9%	11	35.5%
42	Tehama, etc.	181	90.8%	181	89.1%	9	65.0%	2	18.8%
43	Del Norte, etc.	186	94.3%	186	93.7%	13	67.5%	4	36.7%
44	Tuolumne, etc.	180	86.6%	179	84.9%	9	75.0%	8	46.0%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

Note. Dividing line separates counties with a population of more than 500,000 persons as of January 1, 2016.

<sup>1</sup> A complete here includes any HH with any completed extended interview (adult, child, or teen) weighted by the HH weight

<sup>2</sup> Response rate is calculated as the sum of completes and partial completes divided by the sum of eligible cases and unknown cases (adjusted by the eligibility rate).

<sup>3</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata

Table A-3. Overall response rates by sampling stratum and type of interview for the combined, landline/surname list and cell, sample

	Stratum <sup>2</sup>	Interview type overall response rate (%) <sup>1</sup>			
		Household	Adult	Child	Adolescent
	State total	7.1%	6.7%	6.7%	2.4%
1	Los Angeles (8 SPAs)	5.8%	5.6%	6.2%	2.4%
2	San Diego (6 HSRs)	6.7%	6.7%	6.7%	1.7%
3	Orange	6.0%	5.5%	5.6%	1.9%
4	Santa Clara	5.8%	5.5%	5.1%	2.1%
5	San Bernardino	6.4%	5.8%	6.8%	1.7%
6	Riverside	6.2%	5.6%	6.2%	2.3%
7	Alameda	5.8%	5.7%	7.0%	2.1%
8	Sacramento	6.5%	6.1%	6.3%	2.5%
9	Contra Costa	6.0%	5.6%	5.3%	2.3%
10	Fresno	6.8%	6.1%	6.4%	3.0%
11	San Francisco	5.6%	5.6%	5.3%	1.4%
12	Ventura	6.8%	6.1%	7.0%	1.5%
13	San Mateo	5.4%	5.1%	5.6%	2.5%
14	Kern	6.5%	6.2%	6.7%	2.5%
15	San Joaquin	6.8%	6.2%	6.6%	1.1%
16	Sonoma	8.3%	7.8%	6.2%	3.0%
17	Stanislaus	6.0%	5.4%	5.8%	1.3%
18	Santa Barbara	6.9%	6.7%	7.2%	4.0%
19	Solano	5.6%	5.2%	5.0%	1.5%
20	Tulare	9.6%	9.2%	6.8%	3.8%
21	Santa Cruz	10.7%	9.9%	7.7%	2.8%
22	Marin	5.4%	5.1%	5.5%	1.2%
23	San Luis Obispo	28.0%	27.8%	20.8%	13.8%
24	Placer	21.2%	20.9%	17.9%	6.5%
25	Merced	7.2%	6.7%	7.2%	0.9%
26	Butte	29.4%	29.1%	17.4%	7.6%
27	Shasta	33.3%	32.7%	24.2%	9.2%
28	Yolo	32.3%	31.8%	18.5%	8.9%
29	El Dorado	27.5%	27.0%	18.0%	10.6%
30	Imperial	6.4%	5.4%	6.0%	3.5%

(continued)

Table A-3. Overall response rates by sampling stratum and type of interview for the combined, landline/surname list and cell, sample (continued)

	Stratum <sup>2</sup>	Interview type overall response rate (%) <sup>1</sup>			
		Household	Adult	Child	Adolescent
31	Napa	6.8%	6.4%	7.8%	2.6%
32	Kings	6.9%	6.1%	6.7%	1.0%
33	Madera	8.1%	7.8%	8.9%	2.5%
34	Monterey	5.8%	5.4%	6.0%	0.7%
35	Humboldt	38.5%	37.9%	35.7%	23.4%
36	Nevada	7.6%	7.2%	8.3%	1.5%
37	Mendocino	9.3%	8.9%	9.5%	2.1%
38	Sutter	8.0%	7.2%	5.9%	1.3%
39	Yuba	7.8%	7.4%	8.3%	0.9%
40	Lake	9.4%	9.2%	11.3%	4.8%
41	San Benito	6.6%	6.2%	4.7%	3.8%
42	Tehama, etc.	29.5%	29.0%	21.1%	6.1%
43	Del Norte, etc.	32.4%	32.1%	23.2%	12.6%
44	Tuolumne, etc.	19.5%	19.1%	16.9%	10.4%

Source: UCLA Center for Health Policy Research, 2017 California Health Interview Survey.

<sup>1</sup> 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).

<sup>2</sup> Stratum displayed is the stratum as each household was sampled, not their reported strata