



california
health
interview
survey

CHIS 2019-2020 Methodology Report Series

Report 4

Response Rates

September 2021

CALIFORNIA HEALTH INTERVIEW SURVEY

CHIS 2019-2020 METHODOLOGY SERIES

REPORT 4

RESPONSE RATES

SEPTEMBER 2021

This report was prepared for the California Health Interview Survey by Susan Sherr, Jonathan Best, Arina Goyle, Kathy Langdale, Margie Engle-Bauer of SSRS.



www.chis.ucla.edu

This report provides analysts with information about the response rates in CHIS 2019-2020. 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 2019-2020 Methodology Series: Report 4 - Response Rates*. Los Angeles, CA: UCLA Center for Health Policy Research, 2021.

Copyright © 2021 by the Regents of the University of California.

The California Health Interview Survey is a collaborative project of the UCLA Center for Health Policy Research with multiple funding sources. Funding for CHIS 2019-2020 came from the following 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 Mental Health Services Authority, the California Tobacco Control Program, the California Wellness Foundation, First 5 California, Kaiser Permanente, the Long Term Services and Supports Content Development Project, and San Diego County Health and Human Services Agency.

PREFACE

Response Rates is the fourth in a series of methodological reports describing the 2019-2020 California Health Interview Survey (CHIS 2019-2020). The other reports are listed below.

CHIS is a collaborative project of the University of California, Los Angeles (UCLA) Center for Health Policy Research with multiple funding sources from public, private, and non-profit organizations. SSRS was responsible for data collection and the preparation of five methodological reports from the 2019-2020 survey. The survey examines public health and health care access issues in California. The survey is the largest state health survey ever undertaken in the United States.

Methodological Report Series for CHIS 2019-2020

The methodological reports for CHIS 2019-2020 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 2019-2020 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.

Table of Contents

<u>Chapter</u>	<u>Page</u>
PREFACE	i
1. CHIS 2019-2020 SAMPLE DESIGN AND METHODOLOGY SUMMARY	1-1
1.1 Overview	1-1
1.2 Switch in Sampling and Data Collection Methodology	1-2
1.3 Sample Design Objectives	1-3
1.4 Data Collection.....	1-5
1.5 Response Rates.....	1-11
1.6 Weighting the Sample	1-12
1.7 Imputation Methods	1-13
2. USE OF RESPONSE RATES	2-1
3. DEFINING RESPONSE RATES.....	3-1
4. REVIEW OF CONTACT METHODS.....	4-1
4.1 Mail	4-1
4.2 Telephone.....	4-1
5. RESPONSE RATE FORMULAS	5-1
6. RESPONSE RATE TABLES	6-1
6.1 Screener Response Rates.....	6-1
6.2 Person and Household Response Rates.....	6-5
6.3 Overall Response Rates.....	6-11
7. DISCUSSION OF RESPONSE RATES	7-1
7.1 Methods to Enhance Response Rates.....	7-1
7.2 Comparisons of Response Rates over the Cycles	7-4
8. REFERENCES	8-1

List of Tables and Figure

<u>Table</u>	<u>Page</u>
Table 1-1. California county and county group strata used in the CHIS 2019-2020 sample design	1-5
Table 1-2. Number of completed CHIS 2019-2020 interviews by mode of interview and instrument	1-6
Table 1-3. CHIS 2019-2020 survey topic areas by instrument.....	1-8
Table 1-3. CHIS 2019-2020 survey topic areas by instrument (continued).....	1-9
Table 1-3. CHIS 2019-2020 survey topic areas by instrument (continued).....	1-10
Table 1-4a. CHIS response rates - Conditional.....	1-11
Table 1-4b. CHIS response rates - Unconditional	1-11
Figure 6-1. Screener response rate distribution by county-level sampling stratum	6-2
Table 6-1. Number of completed screeners and screener response rates by sampling stratum	6-3
Table 6-1. Number of completed screeners and screener response rates by sampling stratum (continued).....	6-4
Table 6-2. Number of completed screeners and screener response rates by modeled stratum	6-5
Table 6-3. Number of completed extended interviews and response rates by sampling stratum and type of interview (conditional on completed screener).....	6-6
Table 6-3. Number of completed extended interviews and response rates by sampling stratum and type of interview (conditional on completed screener) (continued)	6-7
Table 6-4. Number of completed extended interviews and response rates by modeling stratum and type of interview (conditional on completed screener).....	6-8
Table 6-5. Adult conditional response rates by characteristics of the sampled adult	6-9
Table 6-6. Child conditional response rates by characteristics of the sampled child.....	6-10
Table 6-7. Adolescent response rates conditional on final parent permission by characteristics of the sampled adolescent	6-10
Table 6-8. Adolescent conditional response rates by parental permission status	6-11
Table 6-9. Overall response rates by sampling stratum and type of interview	6-13
Table 6-9. Overall response rates by sampling stratum and type of interview (continued).....	6-14
Table 6-10. Overall response rates by modeling stratum and type of interview.....	6-14
Table 7-1. Number of completed screener and extended interviews by sample type and language.....	7-3
Table 7-2. Comparison of state-level overall response rates from CHIS 2009 to 2019-2020	7-4
Figure 7-1. CHIS overall response rates by type of interview (adult, child, and adolescent).....	7-5

1. CHIS 2019-2020 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 2019-2020.

- 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. 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 multimode (web and 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 multiple funding sources from public, private, and non-profit organizations. 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 in Sampling and Data Collection Methodology

Starting in 2019-2020, the CHIS transitioned from a dual-frame landline/cellphone random digit dial (RDD) methodology to an address-based sample (ABS) methodology with multimode data collection that takes place on the web or by telephone. The CHIS research team deemed this change necessary due to decreasing response to telephone surveys, the improved geographical precision available for stratification when using the US Postal Service Delivery Sequence file of addresses as a sampling frame, and the lower cost of a study where the majority of interviews are completed online.

Prior to launching data collection in 2019, CHIS conducted two experiments in 2018 to test the effectiveness of an ABS mail push-to-web design with a telephone nonresponse follow-up. The first experiment was limited to three counties (Los Angeles, Santa Clara, and Tulare) to achieve a preliminary assessment of the efficacy of the proposed design (see Wells et al., 2018). Following the initial positive results from that test, a statewide pilot test was conducted in the late 2018 implementing a number of additional experiments and improvements based on the previous lessons learned (see Wells et al., 2019). Given that these additional improvements resulted in higher response and reductions in cost compared to maintaining the 2017-2018 design, CHIS committed to transitioning to the new design for the 2019-2020 cycle.

For CHIS 2019-2020, respondents are invited to either complete the survey online or call in to be interviewed by a member of the SSRS interviewing staff. Respondents receive an initial invitation letter with a \$2.00 pre-incentive. This is followed by a reminder postcard and, in 2019, a final certified mail letter for all nonresponders¹. In 2020, the certified mail letter was replaced with a standard letter and final postcard. Where addresses can be matched to a listed telephone number, the nonresponding households are also called six times to attempt to complete an interview before the sampled household is considered to be a resolved nonresponse.

See more about what's new in the 2019-2020 CHIS sampling and data collection here:

¹ For the last 2019 mailing, the certified letter was replaced with a standard letter.

<https://chis.ucla.edu/chis/design/Documents/whats-new-chis-2019-2020.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 2019-2020 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 and year.

1.3 Sample Design Objectives

The CHIS 2019-2020 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 an address-based sample design. For the ABS 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 cycle—to provide health estimates for adults at the local level.

In addition, for CHIS 2019-2020, statistical modeling was used to determine the likelihood that specific targeted groups of interest for oversampling resided at addresses in the sample, and a hierarchy was established to determine the degree of over or undersampling among these strata. CHIS 2017-2018 data were used to build the models. All available auxiliary data from voter registration databases, consumer databases, Marketing Systems Group database information (specifically, all ranges of surnames), and Census Planning Database data were appended to the CHIS 2017-2018 data. All these appended data served as the independent variables (features) in random forest models, while self-

reported attributes (demographics, etc.) served as the dependent variables.

Models for CHIS 2019-2020 were specifically designed to predict the following household attributes:

1. Korean
2. Vietnamese
3. Other Asian
4. Hispanic or Spanish-Speaker
5. Low Educational Attainment or not a US Citizen
6. Have children (under 19)

Since these six models are run independently, households can be predicted to include more than one of the six target groups. For this reason, models were applied to the sample hierarchically with preference to the higher listed model (for example, a household predicted to be Korean was scored as Korean no matter what else they might have been predicted to be).

Utilizing these models results in two additional sample groups, or strata: 1) sample records for which none of the models predicted any attribute (“Residual” sample) and 2) sample for which no auxiliary data were found (“No Match” sample). The final step in utilizing the models was to develop relative sampling fractions by which households were selected within the modeled strata.

Within each geographic and modeled stratum combination, residential addresses 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 via CATI or Web. Most frequently the child interview was completed by the randomly selected respondent who was the parent or guardian. Less frequently and only within the CATI program, an adult sufficiently knowledgeable about the child’s health could complete the child interview.

Table 1-1. California county and county group strata used in the CHIS 2019-2020 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. Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, Trinity
4. Santa Clara	24. Placer	44. Amador, Alpine, Calaveras, Inyo, Mariposa, Mono, Tuolumne
5. San Bernardino	25. Merced	
6. Riverside	26. Butte	

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

The CHIS two-year ABS sample is of sufficient size to accomplish the second objective as well, to produce statistically stable estimates for small population groups such as racial/ethnic subgroups, children, adolescents, etc.

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 dialect), Vietnamese, Korean, and Tagalog. Tagalog was administered by phone only. 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 collaborated with UCLA on the methodology and collected data for CHIS 2019-2020, 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, one randomly selected adult in each sampled household either completed an on-line survey or was interviewed by telephone by an SSRS interviewer. In addition, the study 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. The child interview was moved in 2019-2020 to take place immediately after Section A of the adult survey and the rostering of the household. The adolescent survey took place either immediately after the adult with phone interviews or in a separate session online.

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 if the interview was completed by phone. 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. Table 1-2 shows the number of completed adult, child, and adolescent interviews in CHIS 2019-2020 by mode of interview. Note that these figures were accurate as of data collection completion for 2019-2020 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 2019-2020 interviews by mode of interview and instrument

Type of sample ¹	Adult	Child	Adolescent
Total ABS	44,109 ¹	6,557	2,212
Completes by Web	40,072	6,295	2,000
Completes by phone	4,037	262	212

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

¹ Includes interviews meeting the criteria as partially complete.

Interviews in all languages were administered using SSRS’s computer-assisted web interviewing and computer-assisted telephone interviewing (CAWI/CATI) system. As expected, the CATI interviews were longer in duration. The duration of the CATI interviews averaged almost 48 minutes, 26 minutes, and 23minutes for the adult, child, and adolescent interviews, respectively; the duration of the CAWI interviews averaged around 35 minutes, 13 minutes, and 17 minutes for the adult, child, and adolescent interviews, respectively. Interviews in non-English languages typically took longer to complete across

both modes: the non-English CATI interviews had an average length of about 64 minutes, 31 minutes, and 29 minutes for the adult, child, and adolescent interviews respectively; the non-English CAWI interviews had an average length of about 47 minutes, 18 minutes, and 20 minutes for the adult, child, and adolescent interviews, respectively. Just over four and half percent of the adult interviews were completed in a language other than English, as were about nine percent of all child (parent proxy) interviews and one percent of all adolescent interviews.

Table 1-3 shows the major topic areas for each of the three survey instruments (adult, child, and adolescent). If questions were asked in only one year of survey implementation, the specific year is indicated in the table.

Table 1-3. CHIS 2019-2020 survey topic areas by instrument

Health status	Adult	Adolescent	Child
General health status	✓	✓	✓
Days missed from work or school due to health problems	✓	✓	✓
Health conditions	Adult	Adolescent	Child
Asthma	✓	✓	✓
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			✓
Covid-19	Adult	Adolescent	Child
Covid testing history and effects of pandemic	✓		
Mental health	Adult	Adolescent	Child
Mental health status	✓	✓	
Perceived need, access and utilization of mental health services	✓	✓	
Functional impairment, stigma, three-item loneliness scale	✓		
Suicide ideation and attempts	✓	✓	
Mental health and technology	✓	✓	
Health behaviors	Adult	Adolescent	Child
Dietary and nutritional intake, breastfeeding (younger than 3 years)	✓	✓	✓
Physical activity and exercise, sedentary time		✓	✓
Commute from school to home		✓	✓
Alcohol use/abuse		✓	
Cigarette and E-cigarette use	✓	✓	
Marijuana use	✓	✓	
Opioid use	✓		
Chewing tobacco, tobacco flavors	✓		
Exposure to second-hand smoke	✓		
Sexual behaviors	✓	✓	
HIV testing, HIV prevention medication (PrEP/Truvada)	✓	✓	
Contraceptive use, birth control	✓	✓	
Sexual violence	Adult	Adolescent	Child
Past unwanted sexual encounter	✓		

(continued)

Table 1-3. CHIS 2019-2020 survey topic areas by instrument (continued)

Women's health	Adult	Adolescent	Child
Pregnancy status/plans and birth control	✓	✓	
Dental health	Adult	Adolescent	Child
Last dental visit, main reason haven't visited dentist-	✓	✓	✓
Delays in getting care			✓
Current dental insurance coverage	✓		✓
Condition of teeth	✓	✓	
Neighborhood and housing	Adult	Adolescent	Child
Safety, social cohesion	✓	✓	✓
Homeownership	✓		
Park use, park and neighborhood safety		✓	✓
Civic engagement, community involvement	✓	✓	
Access to and use of health care	Adult	Adolescent	Child
Usual source of care, visits to medical doctor	✓	✓	✓
Emergency room visits	✓	✓	✓
Delays in getting care (prescriptions and medical care)	✓	✓	✓
Communication problems with doctor	✓		✓
Timely appointment	✓	✓	✓
Access to specialist and general doctors	✓		
Tele-medical care	✓		
Care coordination	✓	✓	✓
Voter engagement	Adult	Adolescent	Child
Voter engagement	✓		
Food environment	Adult	Adolescent	Child
Access to-affordable foods-	✓	-	
Availability of food in household over past 12 months	✓		
Hunger	✓		
Health insurance	Adult	Adolescent	Child
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	✓	✓	✓
Medical debt, hospitalizations	✓		

(continued)

Table 1-3. CHIS 2019-2020 survey topic areas by instrument (continued)

Public program eligibility	Adult	Adolescent	Child
Program participation (CalWORKs, Food Stamps, SSI, SSDI, WIC, TANF)	✓	✓	✓
Assets, child support, Social security/pension, worker's compensation	✓		
Medi-Cal renewal	✓		
Reason for Medi-Cal non-participation	✓	✓	✓
Parental involvement/adult supervision	Adult	Adolescent	Child
Parental involvement			✓
Child care and school	Adult	Adolescent	Child
Current child care arrangements			✓
Paid child care	✓		
First 5 California: Talk, Read, Sing Program / Kit for New Parents			✓
Preschool/school attendance, school name		✓	✓
Caregiving	Adult	Adolescent	Child
Caregiving	✓		
Employment	Adult	Adolescent	Child
Employment status, spouse's employment status	✓		
Hours worked at all jobs	✓		
Industry and occupation, firm size	✓		
Income	Adult	Adolescent	Child
Respondent's and spouse's earnings last month before taxes	✓		
Household income, number of persons supported by household income	✓		
Respondent characteristics	Adult	Adolescent	Child
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, 2019-2020 California Health Interview Survey.

1.5 Response Rates

The overall response rates for CHIS 2019-2020 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 2019-2020, the overall household response rate was 12.2 percent (the product of the screener response rate of 16.2 percent and the extended interview response rate at the household level of 75.2 percent). CHIS uses the RR4 type response rate described in the AAPOR (The American Association for Public Opinion Research), 2016 guidelines (see more detailed in *CHIS 2019-2020 Methodology Series: Report 4 – Response Rates*).

The extended interview response rate for the ABS sample varied across the adult (72.0 percent), child (85.7 percent) and adolescent (33.2 percent) interviews. The adolescent rate includes the process of obtaining permission from a parent or guardian.

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 2019-2020 (see Table 1-4b).

Table 1-4a. CHIS response rates - Conditional

Type of Sample	Screener	Household (given screened)	Adult (given screened)	Child (given screened & eligibility)	Adolescent (given screened & permission)
Overall	16.2%	75.2%	72.0%	85.7%	33.2%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

Table 1-4b. CHIS response rates - Unconditional

Type of Sample	Screener	Household (given screened)	Adult (given screened)	Child (given screened & eligibility)	Adolescent (given screened & permission)
Overall	16.2%	12.2%	11.6%	13.9%	5.4%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

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 2019-2020, either a spouse/partner or adult child completed a proxy interview for eight 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 2019-2020 accomplish the following objectives:

- Compensate for differential probabilities of selection for addresses (households) and persons within household;
- Reduce biases occurring because non-respondents may have different characteristics than respondents;
- Adjust, to the extent possible, for undercoverage in the sampling frame 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 address) and several 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 2019-2020 were created primarily from the California Department of Finance's (DOF) 2019 and 2020 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 and Human Services Agency (HHSA) region in San Diego County), and education. One limitation of using 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 DOF control totals prior to calibration.

The DOF control totals used to create the CHIS 2019-2020 weights are based on 2010 Census counts, as were those used for the 2017-2018 cycle. Please pay close attention when comparing estimates using CHIS 2019-2020 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 non-respondents 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, Los Angeles SPA, San Diego HSSA region, 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 2019-2020 were low, with most variables missing valid responses for less than 1% of the sample. Questions that go to fewer overall respondents or that ask about more sensitive topics can have higher nonresponse.

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 continues 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, educational attainment and region of California were imputed by SSRS. UCLA-CHPR began their imputation process by imputing household income so that this characteristic was 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, 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 2019-2020 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. We used the definitions described in the AAPOR (The American Association for Public Opinion Research, 2016) guidelines, which include several different response rate definitions. Among these definitions, RR3 and RR4 are commonly accepted in the research field for surveys like CHIS, as indicated in the following formulae.

$$RR3 = \frac{I}{(I + P) + (R + NC + O) + e(UH + UO)}$$

$$RR4 = \frac{(I + P)}{(I + P) + (R + NC + O) + e(UH + UO)}$$

RR = Response rate

I = Complete interview

P = Partial interview

R = Refusal and break-off

NC = Non-contact

O = Other

UH = Unknown if household/occupied HU

UO = Unknown, other

e = Estimated proportion of cases of unknown eligibility that are eligible

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 address-based sample (ABS) in CHIS 2019-2020. Since sample was drawn with different selection probabilities, we use the weighted number of addresses rather than the number of cases (unweighted) for the response rate computation. This approach also compensates for differential sampling across geographic areas.

AAPOR recommends that a survey response rate be defined as the ratio of completed interviews to eligible reporting units (e.g., residential households). To be eligible, the selected address must be an occupied dwelling unit with at least one resident who is an 18 years or older adult. Determining eligibility can be problematic because despite repeated mail and phone attempts, the household may never attempt the survey. In such a case their eligibility would be deemed unknown. Further, some postal return codes may fail to establish whether an eligible adult lives at the sampled address. The eligibility of sample with these outcomes cannot be determined directly, adding ambiguity to the definition of a response rate.

The proportion of sample units (addresses) with unknown eligibility that are actually eligible is denoted as e in the AAPOR equations. 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 number of cases known to be eligible divided by the number of cases known to be either eligible or ineligible (AAPOR, 2016). This approach was used to estimate e while computing the response rates; a similar 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 response rates. This approach applies to all samples in CHIS 2019-2020. 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. Starting in 2019, aside from a few child completes started before the adult interview under the child-first protocol, all child interviews were completed after Section A in the adult survey. This results in a computed household-level response rate that considers a household to be a respondent if either an adult, child, or a teen interview is completed. The specifics of the computations are discussed in Chapter 5.

Computing a response rate for a subgroup (e.g., females, number of adults in the household) 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 sample are limited. However, the sample can be classified by geography (county or stratum) and modeled strata. 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 number of adults in the household, extended interview response rates can be computed separately for households with the one, two, or three or more adults. However, screener response rates cannot be computed by the numbers of adults in the household because this data is 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 2019-2020.

4. REVIEW OF CONTACT METHODS

CHIS includes both screening and extended interviews. 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 as soon as parental permission and teen assent were obtained. The adult extended interview averaged just over 35 minutes, the child interview about 12 minutes, and the adolescent interview about 16 minutes. Interviews in languages other than English generally took longer than these averages. Detailed interview timing information is given in *CHIS 2019-2020 Methodology Series: Report 2 – Data Collection Methods*.

4.1 Mail

All sample was mailed an initial invitation letter with a \$2 pre-incentive and a Frequently Asked Questions (FAQ) sheet in their targeted language. The letter prominently featured who should complete the survey, the survey URL and a secure access code unique to the household. In addition, a toll-free number was offered for those who wished to complete the survey by phone. The initial mailing was followed by up to two or three additional mailings. The second mailing was a pressure sealed postcard reminder sent to all sampled addresses. This invitation also included the survey URL and a secure access code unique to the household. The third mailing was a letter and FAQ sent to households who had not yet responded, and had also not refused, and were not designated as undeliverable. The fourth mailing was another pressure sealed postcard reminder to households who had not yet responded and had also not refused, and were not designated as undeliverable. Detailed information on the mailings is given in *Report 2 – Section 5.2*.

4.2 Telephone

For those households that did not respond to any of the mailed reminders by completing the survey and for whom a telephone number was able to be matched to the mailing address, up to 6 outbound calls were made to complete a CATI interview. In addition, all recruiting materials offered a telephone number for respondents to dial in and request to be interviewed over the phone. Screening for any telephone interviewing was essentially the same regardless of whether the respondent called in or was contacted by a telephone interviewer.

A variety of other methods were used to increase response rates in CHIS 2019-2020. A very important procedure involved translating and conducting the interview in Spanish, Chinese (Mandarin and Cantonese dialect), Korean, Vietnamese, and Tagalog to accommodate respondents with limited English proficiency. 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 person's health, usually a parent, spouse, or an adult child of the sampled adult completed a proxy interview in these cases; 13 adult proxy extended interviews were completed. In addition to the efforts to encourage respondents to participate, other approaches were used to increase response rates. For CATI interviews, interviewers were trained and given refresher training on methods to avoid refusals and to convert those who had refused. Only 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.

5. RESPONSE RATE FORMULAS

This chapter describes the formulas used to compute the response rates for CHIS 2019-2020. Response rates are calculated for the **screener** and **extended interviews**, including **household, adult, child and adolescent** 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 geographic sampling stratum, where the stratum is a county or group of counties. 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 after adjusting for differential sampling rates (see *CHIS 2019-2020 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. S_{resp} is the set of households in the stratum that responded to the screening interview and S_{elig} is the set of eligible households in the stratum. As noted earlier, estimated eligibility rates were determined using the AAPOR method where the residency rate of the sampled units with unknown residency status is estimated by the observed proportion of residential addresses among all cases where residency status is known.

The screener response rate for the state is computed in exactly the same way, except the sum is over the whole state rather than for the specific stratum. Thus, the state screener response rate is a weighted average of the stratum screener response rates 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 and due to changes in the placement of the child survey, some sampled households 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-level 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. Because of this weighting, adults sampled from households with more than one adult have a larger effect on the response rate than those in households with only one adult. The extended adult response rate (rr_a) is computed as

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

where the numerator is summed over all adult respondents, and the denominator is summed over all eligible sampled adults. The weight being summed in this case, w_i' , 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. The **extended child response rate** (rr_c) is:

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

where the numerator is summed over all completed child interviews in 2019-2020, and the denominator is summed over all eligible sampled children. The weight being summed in this case, w_i'' , is the inverse of the probability of selecting the child within the household.

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

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

where the numerator is summed over all adolescent respondents in 2019-2020, and the denominator is summed over all eligible sampled adolescents. The weight being summed in this case, w_i''' , is the inverse of the probability of selecting the adolescent within the household.

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 response rate and the conditional household response rates and is:

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

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

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

The **child response rate** is also conditioned on the screener being completed and on the child interview being completed for households with children. The **overall child response rate**, is defined as:

$$orr_c = rr_s \times rr_c \quad (5-8)$$

The **overall adolescent response rate** accounting for screener response and teen response in households with an eligible teen is:

$$orr_t = rr_s \times rr_t \quad (5-9)$$

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

6. RESPONSE RATE TABLES

This chapter provides tables of response rates for CHIS 2019-2020. The first section presents the screener response rates by county-level and modeled sampling stratum. The second section presents the response rates for the adult, child, and adolescent interviews by the same sampling stratum. 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.

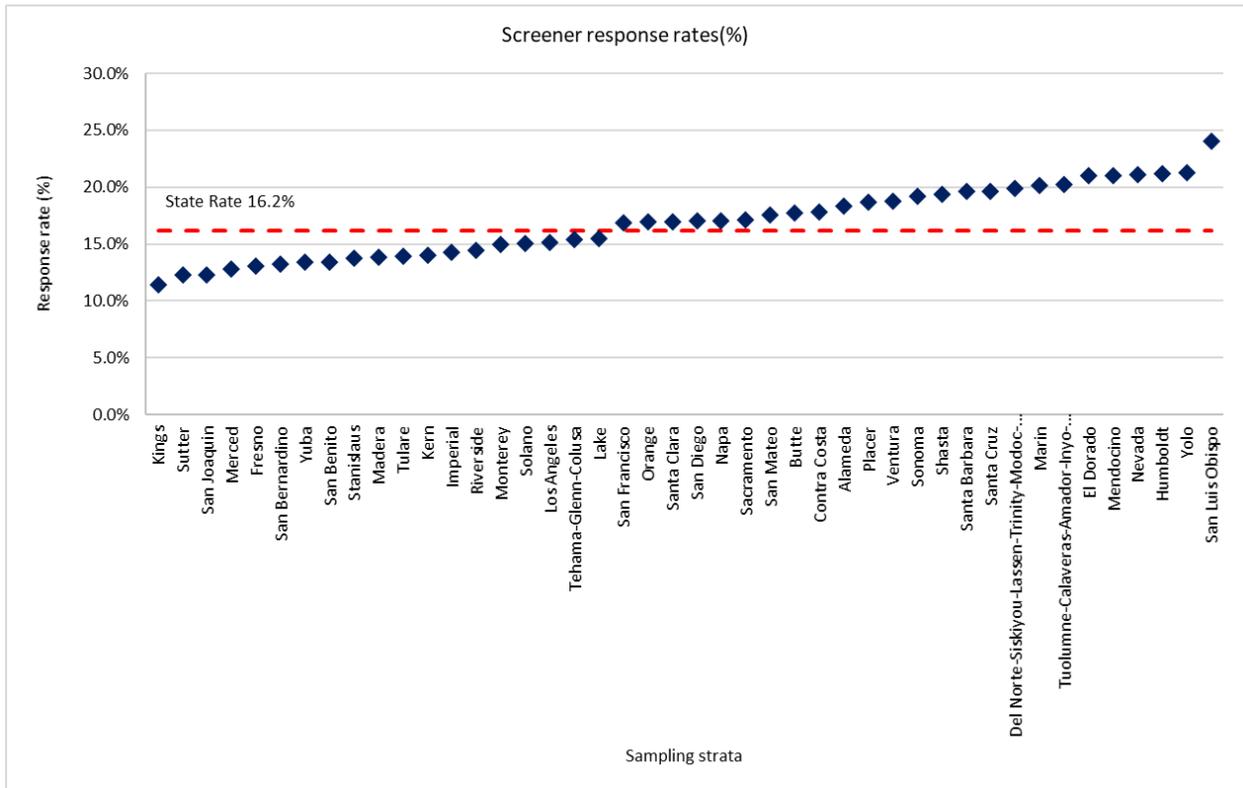
6.1 Screener Response Rates

The screener response rates by the county-level sampling stratum are presented in Table 6-1, and the response rates by the modeling level stratum are presented in Table 6-2. The first column in these tables gives the number of households that completed the screening interview. Overall, 60,306 households completed the CHIS 2019-2020 screener interview. In each of these households, one adult was sampled.

As Figure 6-1 shows, the overall weighted screener response rate for the state is 16.2 percent. As discussed in Chapter 3, this response rate was computed using the AAPOR RR4 method to allocate sampled addresses whose eligibility cannot be determined (e.g., households that did not respond to the survey invite or where mail was returned with certain postal codes). Surveys vary in how they account for undetermined residential 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 AAPOR RR4 method for undetermined eligibility cases.

Table 6-1 shows that the screener response rates vary by county, which is also illustrated in Figure 6-1. The median response across all counties is 17.0 percent, and the highest response rate is 24.1 percent in the stratum for San Luis Obispo. Kings has the lowest response rate at 11.4 percent while the next lowest response rate, Sutter, is about 0.9 points higher than the response rate in Kings. The screener response rate in Los Angeles is 3.7 points higher than the Kings rate and 1.1 points lower than the state response rate. The county rankings shown in Figure 6-1 vary from those in previous CHIS cycles, likely due to the change in sampling frame and mode in CHIS 2019-2020 (for a detailed discussion please refer to *CHIS 2019-2020 Methodology Series: Report 2 – Data Collection Methods*).

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



The median response rate for counties with a population of more than 500,000 persons (as of January 1, 2019 which consists of the counties from Los Angeles through Stanislaus in Table 6-1) is 16.9 percent. This is 0.8 percentage points lower than the 17.7 percent median response rate for the smaller counties. Looking at the individual counties suggests that this difference may be a function of proximity to a metropolitan area or population density rather than the population size of the county. Small, highly urban counties have rates similar to those of the more populous counties.

Table 6-1. Number of completed screeners and screener response rates by sampling stratum

Stratum ³	Total	
	Complete ¹	Response rate ² (%)
State total	60,306	16.2%
1 Los Angeles (8 SPAs)	12,308	15.1%
2 San Diego (6 HSRs)	6,313	17.0%
3 Orange	3,400	16.9%
4 Santa Clara	2,106	16.9%
5 San Bernardino	2,267	13.2%
6 Riverside	2,479	14.5%
7 Alameda	1,872	18.3%
8 Sacramento	1,667	17.1%
9 Contra Costa	1,297	17.8%
10 Fresno	1,136	13.1%
11 San Francisco	1,201	16.8%
12 Ventura	889	18.7%
13 San Mateo	878	17.6%
14 Kern	1,000	14.0%
15 San Joaquin	834	12.3%
16 Sonoma	761	19.2%
17 Stanislaus	748	13.8%
18 Santa Barbara	691	19.6%
19 Solano	766	15.1%
20 Tulare	733	13.9%
21 Santa Cruz	714	19.6%
22 Marin	695	20.2%
23 San Luis Obispo	676	24.1%
24 Placer	711	18.6%
25 Merced	745	12.8%
26 Butte	674	17.7%
27 Shasta	702	19.3%
28 Yolo	673	21.3%
29 El Dorado	654	21.0%
30 Imperial	798	14.3%
31 Napa	711	17.0%
32 Kings	820	11.4%
33 Madera	758	13.8%
34 Monterey	697	15.0%
35 Humboldt	698	21.2%
36 Nevada	670	21.1%

(continued)

Table 6-1. Number of completed screeners and screener response rates by sampling stratum (continued)

Stratum ³	Total	
	Complete ¹	Response rate ² (%)
37 Mendocino	675	21.0%
38 Sutter	786	12.3%
39 Yuba	720	13.4%
40 Lake	691	15.4%
41 San Benito	693	13.4%
42 Tehama, etc.	713	15.4%
43 Del Norte, etc.	597	19.9%
44 Tuolumne, etc.	689	20.2%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

Note. Dividing line separates counties with a population of more than 500,000 persons as of January 1, 2019.

¹ A complete here includes any household with a completed screening interview.

² 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).

³ Stratum displayed is the stratum as each household was sampled.

Table 6-2 shows that the screener response rates also vary slightly by modeled stratum. Households deemed to be Hispanic or Spanish speaking had the lowest response rate at 10.9%, which was 5.3 points lower than the state response rate. The residual strata had the highest response rate within the modeled stratum at 18.0%, which was 1.8 point higher than the state response rate.

Table 6-2. Number of completed screeners and screener response rates by modeled stratum

Stratum ³	Total	
	Complete ¹	Response rate ² (%)
Korean Household	836	16.6%
Vietnamese Household	866	15.0%
Other Asian Household	2,936	17.9%
Hispanic or Spanish-Speaking Household	6,055	10.9%
Household with adult with low educational attainment or an adult who is not a citizen	3,653	14.0%
Household with a child (under 19)	11,003	17.0%
Residual group	32,160	18.0%
No auxiliary data group	2,797	14.0%
State total	60,306	16.2%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

¹ A complete here includes any HH with a completed screening interview.

² 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).

³ Stratum displayed is the stratum as each household was sampled

6.2 Person and Household Response Rates

The household, adult, child, and adolescent extended interview response rates for each county-level stratum are presented in Table 6-3, along with the number of completed interviews, and for each modeled stratum are presented in Table 6-4. There were 45,399 households where either an adult, child or adolescent extended interview was completed, resulting in a statewide household level response rate of 75.2 percent. Additionally, 44,109 adult interviews (including 642 partial interviews), 6,557 interviews about children, and 2,212 adolescent interviews were completed.

The statewide adult conditional response rate, as shown in Tables 6-3 and 6-4, for the adult interview was 72.0 percent, an increase of 29.7 percentage points from CHIS 2017-2018.

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 72.3 percent, while for counties with less than 500,000 the median adult response rate is 74.8 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 2019-2020 child interview state level conditional response rate was 85.7 percent, which is 27.4 percentage points higher than the child response rate observed in CHIS 2017-2018. The state level adolescent conditional interview rate is 33.2 percent, which is 11.9 points higher than the rate observed in CHIS 2017-2018.

Table 6-3. Number of completed extended interviews and response rates by sampling stratum and type of interview (conditional on completed screener)

Stratum ³	Household		Adult ⁴		Child		Adolescent	
	Complete ¹	Response rate ² (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
State total	45,399	75.2%	44,109	72.0%	6,557	85.7%	2,212	33.2%
1 Los Angeles	8,831	73.3%	8,555	68.2%	1,266	82.6%	382	28.7%
2 San Diego	4,877	76.7%	4,740	74.2%	732	87.6%	251	35.3%
3 Orange	2,575	75.2%	2,513	73.1%	339	86.6%	139	37.4%
4 Santa Clara	1,619	76.3%	1,574	73.4%	286	88.9%	85	32.5%
5 San Bernardino	1,646	72.1%	1,593	68.6%	266	87.0%	95	32.6%
6 Riverside	1,886	76.0%	1,817	71.5%	284	86.1%	111	34.4%
7 Alameda	1,450	77.2%	1,419	74.8%	202	86.8%	73	37.4%
8 Sacramento	1,325	78.1%	1,301	77.0%	193	89.0%	57	32.4%
9 Contra Costa	971	73.4%	950	72.3%	131	79.1%	36	30.2%
10 Fresno	828	72.3%	798	69.3%	144	84.2%	56	38.2%
11 San Francisco	943	78.3%	923	76.6%	119	91.9%	35	48.4%
12 Ventura	684	75.6%	666	73.8%	93	83.7%	31	31.2%
13 San Mateo	669	75.5%	652	72.3%	98	88.1%	35	35.6%
14 Kern	723	71.7%	687	67.9%	145	83.7%	32	22.3%
15 San Joaquin	605	72.7%	591	70.7%	97	86.3%	40	37.8%
16 Sonoma	589	78.3%	581	75.5%	71	81.5%	18	33.3%
17 Stanislaus	567	76.0%	542	72.2%	91	90.0%	26	33.3%
18 Santa Barbara	545	76.8%	534	75.1%	68	88.7%	25	34.3%

(continued)

Table 6-3. Number of completed extended interviews and response rates by sampling stratum and type of interview (conditional on completed screener) (continued)

Stratum ³	Household		Adult ⁴		Child		Adolescent	
	Complete ¹	Response rate ² (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
19 Solano	584	74.7%	575	73.6%	67	79.2%	10	14.6%
20 Tulare	526	71.2%	503	68.3%	101	85.6%	31	28.8%
21 Santa Cruz	546	75.6%	541	74.6%	49	86.8%	25	34.8%
22 Marin	545	79.2%	529	74.8%	75	84.3%	36	33.1%
23 San Luis Obispo	527	76.8%	516	75.5%	75	88.5%	16	29.2%
24 Placer	560	79.4%	540	75.2%	89	87.4%	34	39.0%
25 Merced	548	71.7%	519	68.0%	102	86.8%	33	29.9%
26 Butte	530	78.0%	517	75.7%	71	87.7%	16	23.7%
27 Shasta	544	76.9%	534	76.5%	60	88.5%	26	42.9%
28 Yolo	544	81.0%	530	78.1%	88	90.0%	40	49.2%
29 El Dorado	512	77.6%	506	76.1%	57	84.5%	28	36.0%
30 Imperial	559	69.1%	524	65.2%	112	80.0%	35	25.1%
31 Napa	567	80.9%	559	78.5%	63	88.4%	22	31.3%
32 Kings	594	70.3%	574	69.9%	118	84.0%	45	37.8%
33 Madera	544	70.3%	525	67.3%	92	86.0%	30	37.8%
34 Monterey	525	73.5%	505	70.1%	68	87.7%	27	36.3%
35 Humboldt	559	82.6%	548	77.5%	56	86.9%	28	54.3%
36 Nevada	528	80.4%	519	77.3%	50	90.6%	13	25.8%
37 Mendocino	519	78.0%	509	74.8%	47	95.7%	18	29.2%
38 Sutter	574	71.2%	550	67.9%	91	88.0%	26	29.7%
39 Yuba	523	73.6%	506	68.7%	97	85.3%	35	34.9%
40 Lake	526	75.7%	518	75.3%	57	86.7%	23	42.6%
41 San Benito	517	75.1%	498	71.0%	68	81.3%	30	32.6%
42 Tehama, etc.	512	72.3%	493	67.2%	76	82.1%	23	31.4%
43 Del Norte, etc.	504	84.4%	494	82.0%	61	94.7%	16	33.8%
44 Tuolumne, etc.	549	80.6%	541	78.1%	42	87.0%	19	48.4%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

¹ A complete here includes any household with any completed extended interview (adult, child, or teen) weighted by the HH weight.

² 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).

³ Stratum displayed is the stratum as each household was sampled.

⁴ The adult completes also include partial interviews.

Displaying a similar trend as the screener response rates, households deemed to be Hispanic or Spanish speaking had the lowest adult response rate at 62.5%, which was 9.5 points lower than the state response rate. The Residual stratum had the highest response rate within the modeled stratum at 75.0%, which was 3.0 point higher than the state response rate.

Table 6-4. Number of completed extended interviews and response rates by modeling stratum and type of interview (conditional on completed screener)

Stratum ³	Household		Adult		Child		Adolescent	
	Complete ¹	Response rate ² (%)	Complete	Response rate (%)	Complete	Response rate (%)	Complete	Response rate (%)
Korean Household	626	74.3%	613	71.7%	102	86.0%	28	33.1%
Vietnamese Household	631	72.3%	613	69.9%	313	88.0%	43	33.9%
Other Asian Household	2,235	75.8%	2,164	73.4%	744	85.7%	96	29.7%
Hispanic or Spanish-Speaking Household	4,050	66.8%	3,869	62.5%	397	82.9%	225	26.3%
Household with adult with low educational attainment or an adult who is not a citizen	2,624	72.0%	2,537	68.3%	2,265	86.0%	127	30.9%
Household with a child (under 19)	8,248	74.9%	7,858	71.0%	333	86.5%	904	38.1%
Residual group	24,904	76.8%	24,460	75.0%	85	86.2%	723	31.7%
No auxiliary data group	2,081	75.1%	1,995	69.2%	149	83.0%	66	27.2%
State total	45,399	75.2%	44,109	72.0%	2,318	85.7%	2,212	33.2%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

Data collected in the screener interview about the household and the sampled adult can be used to examine the adult extended response rates since the data are available for all sampled adults. Table 6-5 shows the adult response rates by these screener data items.

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

Characteristic	Response Rate
Total	72.0%
Number of adults in household	
1	78.6%
2	73.2%
3 or more	68.3%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

Response rates tend to decline as more adults are present in the household. A major reason for this is that, for households with more than one adult the person reached might not be the person with the next birthday. For CAWI, this would require the person to log off and ask the adult with the next birthday to log on and complete the survey. For CATI, if the sampled adult is not home, a call-back is required, essentially creating a second contact attempt.

Now, we examine the child extended interview response rates. Table 6-3 shows that the statewide child-level response rate is 85.7 percent. Section 7.2 offers a more in-depth discussion of the reason for the higher response rate. 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. Note, child gender and age was missing for approximately 3% of sampled child cases, which results in a slightly higher child response rate for those cases where gender and age were provided compared with the total child response rate. *CHIS 2019-2020 Methodology Series: Report 2 – Data Collection Methods* contains more detail on response to the child interview.

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

Characteristic	Response Rate
Total	85.7%
Sex	
Male	86.3%
Female	86.3%
Number of children in household	
1	87.7%
2	83.7%
3	82.0%
4 or more	82.7%
Age group	
0-5	86.5%
6-11	85.9%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

The last person-level response rates presented are for the adolescent interview. An eligible teen was interviewed as soon as parental permission and teen assent were obtained. If a parent refused permission, they received a letter asking them to reconsider and offering an incentive. Further, all teens were offered a \$10 post-incentive for completion. Table 6-7 shows that the state-level landline adolescent response rate is 33.2 percent. This table also gives the adolescent response rates by the gender and age of the adolescent based on data collected in the adult interview or screener. Note, gender was missing for approximately 3% of sampled teen cases, and age was missing for approximately 5% of sampled teen cases, which results in a slightly higher teen response rate for those cases where gender and age were provided compared with the total teen response rate.

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

Characteristic	Response Rate
Total	33.2%
Sex	
Male	32.8%
Female	35.0%
Age group	
12-14	31.6%
15-17	36.0%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

To better understand the success rate for interviewing adolescents, we parsed the response rates for the adolescent interview by whether the parents gave initial permission to interview or not. This rate indicates the ability to contact and interview the adolescents where initial permission was granted and suggests the success rate for converting refusals for parental permissions. These rates are presented in Table 6-8. Not surprisingly, the adolescent response rate for cases where initial parental permission was granted is much higher (56.3%) when compared with cases where permission was not granted during the survey (9.5%).

Table 6-8. Adolescent conditional response rates by parental permission status

Characteristic	Initial Parent Permission		Final Permission Granted
	Granted	Not Granted	
Total	56.3%	9.5%	33.2%
N ¹	1,911	301	2,212
Sex			
Male	55.6%	9.9%	32.8%
Female	57.7%	9.6%	35.0%
Age group			
12-14	56.4%	8.1%	31.6%
15-17	57.0%	11.2%	36.0%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey

¹ Ns are unweighted, but the response rates are weighted.

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 considered in developing the weights as described in *CHIS 2019-2020 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 CHIS 2019. Table 6-9 gives these response rates for the entire state and by county, and Table 6-10 gives these response rates by the modeled stratum. As discussed in

Chapter 5 (Response Rates Formulas), 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 and 6-2) multiplied by the household response rate (from Table 6-3 and 6-4). 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

Stratum ²	Interview type overall response rate (%) ¹			
	Household	Adult	Child	Adolescent
State total	12.2%	11.6%	13.9%	5.4%
1 Los Angeles (8 SPAs)	11.1%	10.3%	12.5%	4.3%
2 San Diego (6 HSRs)	13.0%	12.6%	14.9%	6.0%
3 Orange	12.7%	12.4%	14.7%	6.3%
4 Santa Clara	12.9%	12.4%	15.1%	5.5%
5 San Bernardino	9.5%	9.1%	11.5%	4.3%
6 Riverside	11.0%	10.3%	12.5%	5.0%
7 Alameda	14.2%	13.7%	15.9%	6.9%
8 Sacramento	13.3%	13.2%	15.2%	5.5%
9 Contra Costa	13.1%	12.9%	14.1%	5.4%
10 Fresno	9.5%	9.1%	11.0%	5.0%
11 San Francisco	13.2%	12.9%	15.5%	8.1%
12 Ventura	14.2%	13.8%	15.7%	5.8%
13 San Mateo	13.3%	12.7%	15.5%	6.3%
14 Kern	10.0%	9.5%	11.7%	3.1%
15 San Joaquin	8.9%	8.7%	10.6%	4.7%
16 Sonoma	15.0%	14.5%	15.6%	6.4%
17 Stanislaus	10.5%	9.9%	12.4%	4.6%
18 Santa Barbara	15.1%	14.7%	17.4%	6.7%
19 Solano	11.3%	11.1%	11.9%	2.2%
20 Tulare	9.9%	9.5%	11.9%	4.0%
21 Santa Cruz	14.8%	14.6%	17.0%	6.8%
22 Marin	16.0%	15.1%	17.0%	6.7%
23 San Luis Obispo	18.5%	18.2%	21.3%	7.0%
24 Placer	14.8%	14.0%	16.3%	7.3%
25 Merced	9.2%	8.7%	11.1%	3.8%
26 Butte	13.8%	13.4%	15.5%	4.2%
27 Shasta	14.9%	14.8%	17.1%	8.3%
28 Yolo	17.2%	16.6%	19.2%	10.5%
29 El Dorado	16.3%	16.0%	17.7%	7.6%
30 Imperial	9.9%	9.3%	11.4%	3.6%
31 Napa	13.8%	13.4%	15.0%	5.3%
32 Kings	8.0%	8.0%	9.6%	4.3%
33 Madera	9.7%	9.3%	11.9%	5.2%
34 Monterey	11.0%	10.5%	13.1%	5.4%
35 Humboldt	17.5%	16.4%	18.4%	11.5%
36 Nevada	16.9%	16.3%	19.1%	5.4%
37 Mendocino	16.4%	15.7%	20.1%	6.1%
38 Sutter	8.7%	8.3%	10.8%	3.6%
39 Yuba	9.8%	9.2%	11.4%	4.7%

(continued)

Table 6-9. Overall response rates by sampling stratum and type of interview (continued)

Stratum ²	Interview type overall response rate (%) ¹			
	Household	Adult	Child	Adolescent
40 Lake	11.7%	11.6%	13.4%	6.6%
41 San Benito	10.1%	9.5%	10.9%	4.4%
42 Tehama, etc.	11.1%	10.3%	12.6%	4.8%
43 Del Norte, etc.	16.8%	16.3%	18.8%	6.7%
44 Tuolumne, etc.	16.3%	15.8%	17.6%	9.8%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

¹ 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).

² Stratum displayed is the stratum as each household was sampled.

Table 6-10. Overall response rates by modeling stratum and type of interview

Stratum ²	Interview type overall response rate (%) ¹			
	Household	Adult	Child	Adolescent
Korean Household	12.4%	11.9%	14.3%	5.5%
Vietnamese Household	10.8%	10.5%	13.2%	5.1%
Other Asian Household	13.5%	13.1%	15.3%	5.3%
Hispanic or Spanish-Speaking Household	7.3%	6.8%	9.0%	2.9%
Household with adult with low educational attainment or an adult who is not a citizen	10.1%	9.6%	12.1%	4.3%
Household with a child (under 19)	12.7%	12.0%	14.7%	6.5%
Residual group	13.9%	13.5%	15.6%	5.7%
No auxiliary data group	10.5%	9.7%	11.6%	3.8%
State total	12.2%	11.6%	13.9%	5.4%

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

¹ 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).

² Stratum displayed is the stratum as each household was sampled.

Since the response rates in these tables are the product of two or more interview-level rates, the previously described issues regarding the differences in response rates by county, type of household, and characteristic of the sampled person also apply here. The overall adult response rate in CHIS 2019-2020 was 11.6 percent, 8.2 percentage points higher than the overall adult response rate in CHIS 2017-2018.

7. DISCUSSION OF RESPONSE RATES

This chapter presents a discussion of the response rates obtained in CHIS 2019-2020, including procedures used to increase response rates. The first section briefly reviews some of the methods used in CHIS 2019-2020 that impact response rates. A more complete discussion of these data collection methods is provided in *CHIS 2019-2020 Methodology Series: Report 2 – Data Collection Methods*.

7.1 Methods to Enhance Response Rates

Methods for enhancing response rates in CHIS 2019-2020 included:

- **Switch to an ABS sampling frame** – Due to a precipitous drop in telephone response rates, and an accompanying increase in costs, in 2018 UCLA and SSRS conducted extensive pilot testing in 2018 to explore the possibility of using ABS sample for future CHIS waves (Wells et al., 2018, 2019), as opposed to RDD sample used for previous waves. The results from these preliminary pilot tests were encouraging with higher response rates and lower costs. Based on these results CHIS transitioned to address-based sampling ABS in 2019.
- **Mixed-mode design** – In a departure from previous CHIS cycles which have relied solely on telephone dialing, CHIS 2019-2020 employed a mixed-mode design with a mail push-to-web and a telephone non-response follow up. This approach involved sending a mail to all sampled addresses and encouraging them to participate in CHIS 2019-2020 via web. For sample where a phone append was obtained, the push-to-web mailings were followed up with telephone dialing. Respondents could also call in at any time during the field period to complete the survey.
- **\$2 pre-incentive** – All sample was mailed a \$2 pre-incentive with the initial invitation letter.
- **Repeated mailings** – Respondents received up to three mailings in 2019, and up to four mailing in 2020. In 2019, the second mailing was a postcard, and the third mailing was a certified letter for the majority of the respondents. In 2020, the second mailing and fourth mailing were postcards, and the third mailing was a letter. (please see *CHIS 2019-2020 Methodology Series: Report 2 – Data Collection Methods* for a more detailed discussion).
- **Repeated call attempts:** The procedures implemented in CHIS 2019-2020 allowed for an average of 6 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 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 2019-2020, a total of 13 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.
- **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 2019-2020 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 7-1 gives the number of interviews that were completed by language. 3,739 households completed the screener using a language other than English, accounting for about 6 percent of all the completed screener interviews in CHIS 2019-2020. Spanish was the most frequently used language, with 72 percent of the non-English screener interviews being completed in Spanish. Chinese was the second most frequently used language in the interviews, with 16% of the non-English screener interviews being completed in Chinese.

Table 7-1. Number of completed screener and extended interviews by sample type and language

Interview type Sample type	English	Non-English					Total	Total
	Spanish	Vietnamese	Korean	Chinese	Tagalog			
Screeners Interviews	56,567	2,705	128	320	584	2	3,739	60,306
Adult Interviews ^a	41,992	1,354	83	254	425	1	2,117	44,109
Child Interviews	5,977	455	12	34	79		580	6,557
Teen Permission Interviews	3,363	263	10	16	27		316	3,679
Teen Interviews	2,189	20		1	2		23	2,212

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

^a Includes completed and partial interviews.

7.2 Comparisons of Response Rates over the Cycles

Unlike previous CHIS cycles, CHIS 2019-2020 employed an ABS sampling frame and mixed-mode survey design. There were also significant differences to the survey procedures. Like previous cycles of CHIS, 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. Where the survey procedure differed was the placement of the child and teen roster and the child interview, and the teen protocol. Previously children and teens were rostered during the screener interview, or after section G in the adult survey. Except for child interviews under the child-first procedures implemented in 2005, previously all child interviews were completed after the adult interview. In CHIS 2019-2020, the child and teen rostering section and the child interview was moved up to the end of Section A, leading to all child interviews being completed before the corresponding adult interview. The teen protocol was modified where parents refusing permission got a letter asking them to reconsider and offering them a \$10 post incentive if their teen completed, along with all teens getting a \$10 post-incentive. It is important to consider these changes while comparing the response rate to CHIS across the different waves.

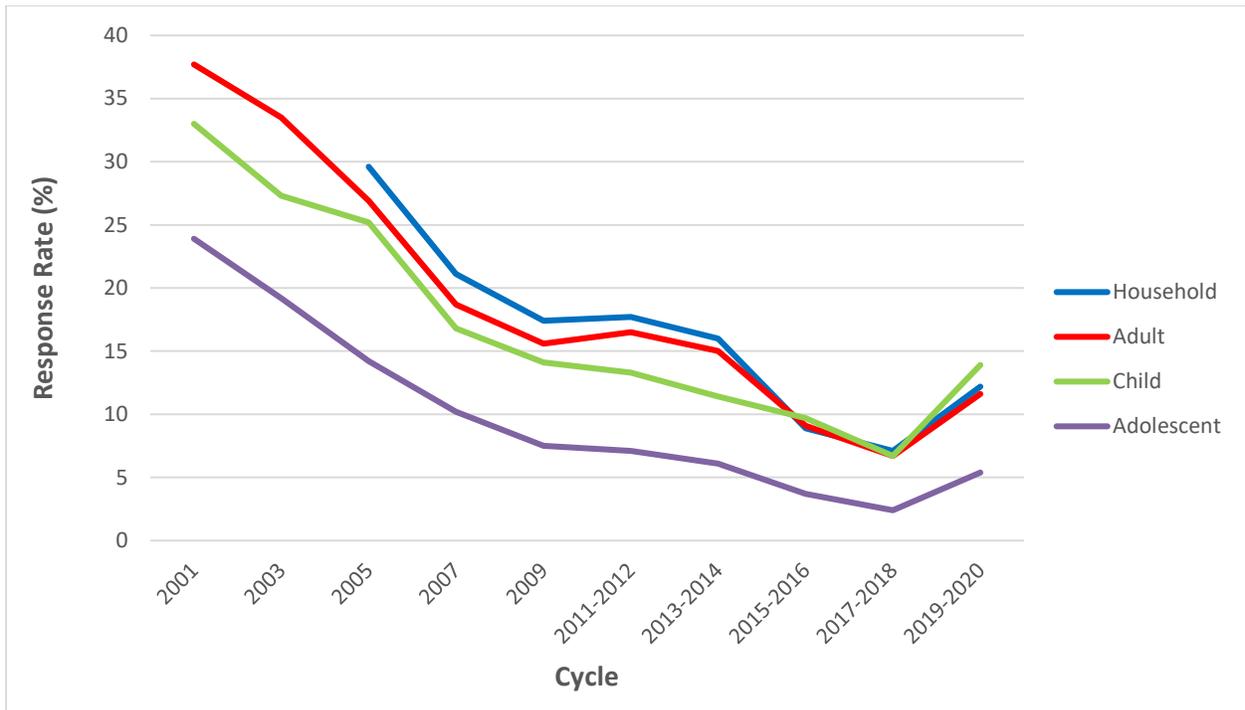
Table 7-2 summarizes the screener interview, extended interview, overall, and combined overall response rates by cycle for the CHIS samples. The same information is presented graphically in Figure 7-1. The state-level response rate had been showing a downward trend since CHIS 2015-2016, but the changes made to CHIS 2019-2020 yielded dramatic improvements where the adult response rate was 11.6 percent, 8.0 points higher than CHIS 2017-2018. Similarly, the child response rate in 2019-2020 was 13.8 percent, 9.0 points higher than the rate in CHIS 2017-2018, and the teen response rates in 2019-2020 was 5.4 percent, which was 3.6 points higher than the previous CHIS cycle.

Table 7-2. Comparison of state-level overall response rates from CHIS 2009 to 2019-2020

Type	2009	2011-2012	2013-2014	2015-2016	2017-2018	2019-2020
Household	17.4	17.7	16.0	8.9	4.0	12.2
Adult	15.6	16.5	15.0	9.1	3.4	11.6
Child	14.1	13.3	11.4	9.7	4.6	13.9
Adolescent	7.5	7.1	6.1	3.7	1.7	5.4

Source: UCLA Center for Health Policy Research, 2019-2020 California Health Interview Survey.

Figure 7-1. CHIS overall response rates by type of interview (adult, child, and adolescent)



8. REFERENCES

- Brick, J. M. (2013). Unit nonresponse and weighting adjustments: A critical review. *Journal of Official Statistics*, 29, pp. 329-353.
- 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-saliency 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.
- Wells, B. M., Hughes, T., Park, R., CHIS Redesign Working Group, Rogers, T. B., & Ponce, N. (2018). *Evaluating the California Health Interview Survey of the future: Results from a methodological experiment to test an address-based sampling mail push-to-web data collection*. Los Angeles, CA: UCLA Center for Health Policy Research.
- Wells, B. M., Hughes, T., Park, R., CHIS Redesign Working Group, & Ponce, N. (2019). *Evaluating the California Health Interview Survey of the future: Results from a statewide pilot of an address-based sampling mail push-to-web data collection*. Los Angeles, CA: UCLA Center for Health Policy Research.