BOLD THINKERS DRIVING REAL-WORLD IMPACT

2018 Los Angeles County Health Survey (LACHS)

Methods Report

June 29, 2019

Submitted to:
Los Angeles County Department of Public Health
Office of Health Assessment and Epidemiology
Population Health Assessment Unit
313 N. Figueroa Street, Room 127
Los Angeles, CA 90012

Submitted by:
Abt Associates
6130 Executive Blvd
Rockville, MD 20852

Table of Contents

Introduction

The Los Angeles County Health Survey (LACHS) is an invaluable surveillance and monitoring tool for assessing the health needs and behaviors of Los Angeles County residents, evaluating current programs and initiatives, and planning public health policies for the future. The 2018-19 LACHS was originally designed to include a representative sample of 8,000 adults aged 18+ years and 6,000 children aged 0-17 years who reside in Los Angeles County. However, due to increases in cost, the sample size was modified to 7,000 adult interviews and 5,000 child interviews. The Adult and Child Surveys were both designed to include a minimum of 500 interviews in each of Los Angeles County's eight Service Planning Areas (SPAs).

The Adult Survey was conducted with a fully overlapping dual frame of landline and cell phone samples and designed to include at least 40% of interviews with cell phone only (CPO) households. The Child Survey was also conducted using a fully overlapping dual frame sample in which households were screened for the presence of children, with additional interviews originating from households that completed the Adult Survey and had children. The Child Survey was also designed to include a minimum of 40% of interviews with CPO households.

Sampling procedures generally followed similar methods used for the 2015 LACHS, with one notable exception:

- The proportions of Adult and Child Survey interviews completed with cell phone only households were increased to improve representation of the population.

1. Populations of Interest and Study Design

1.1 Overview

The 2018 Los Angeles County Health Survey (LACHS) was commissioned by the Los Angeles County Department of Public Health (LAC DPH) and conducted by Abt Associates Inc. (Abt).

The 2018 LACHS was the eighth iteration of the LACHS (1997, 1999, 2002, 2005, 2007, 2011, and 2015). The LACHS collects information on adults and children in Los Angeles (LA) County about overall health, health care issues and health indicators of physical and mental well-being. The survey also helps identify key areas to address when planning for the provision of health care to LA County residents. It is designed to allow the County to develop accurate, reliable measurements for tracking health status, health conditions, access to care, use of available health services, and other health-related behaviors of LA County residents.

Abt assisted the Department of Public Health with the design and execution of the 2018 Adult and Child Surveys, including:

- Developing the sampling design and sample management to achieve the desired number of completed interviews in each Service Planning Area (SPA)
- Reviewing and providing recommendations on the survey instruments
- Translating the instruments into Spanish, Cantonese, Mandarin, Korean and Vietnamese
- Programming the instrument into our Computer Assisted Telephone Interviewing (CATI) system for administration by telephone
- Pre-testing and pilot testing the survey instruments
- Data collection (telephone interviewing)
- Data processing and coding
- Development and creation of the statistical weights
- CATI system address and cross-street information in-script validation during the interview to assign a preliminary SPA and Health District
- Preparation and delivery of survey data files to the LAC DPH's Population Health Assessment Unit

The 2018 LACHS was, like previous waves of the LACHS, a population-based random digit dial telephone survey of the adult and child populations in Los Angeles County, California. The households sampled included single-family homes, townhouses, condominiums, apartments or mobile homes which are occupied by individuals, families, multiple families, extended families, or multiple unrelated individuals. With the inclusion of cell phones, the LA County population residing in institutionalized and group quarters such as communes, convents/rectories, shelters, halfway houses, dormitories, prisons, jails, juvenile detention facilities, psychiatric hospitals, military barracks, residential treatment programs, nursing homes for the disabled/aged, and the homeless were also included in the LACHS.

Separate survey instruments were designed to collect data on the adult and child populations:

1. Adult Survey – Collects data about the adult population of LA County from a sample of LA County households.

2. Child Survey – Collects data about the child population of LA County from a sample of LA County households with at least 1 child under 18 years of age.

Probability samples of landline and cellular telephone numbers were used to conduct the surveys. Together, the landline and cellular telephone frames include the household population of LA County with telephone service. Since the cellular frame is designed to target LA County residents, out-of-frame cell phone area codes were excluded from the frame.

1.2 Tracking Completed Interviews by SPA

The Adult and Child surveys were both designed to include a minimum of 500 interviews in each of LA County's eight SPAs. SPA boundaries are defined by census tracts. While respondents cannot accurately report the census tract or SPA in which they live, they can provide ZIP code and address or cross-street information. For the 2015 survey, the LAC DPH provided Abt with a list of LA County ZIP codes which constituted the ZIP-to-SPA mapping used for estimates during data collection; the 2015 ZIP-to-SPA mapping was used for the 2018 cycle. While estimating respondents' SPA was useful in managing the sample during data collection, accurate SPA assignments for the final LACHS was done by the LAC DPH using precise geographic information.

Census tracts of residence were determined by asking respondents where they lived. Abt used a "live" geocoding process that operates within our CATI system to code respondent-reported address or cross-streets and assign census tract. In this system, respondent-reported address or cross-streets are submitted to a live, online service that translates this information to latitude and longitude coordinates. If the input fails to find an accurate match, follow-up clarification questions are asked. The system records the accuracy to which the input is geocoded.

1.3 Defining the Sample Frames

Abt used similar procedures to those used in the 2015 LACHS to obtain and define the landline and cell phone samples for the 2018 LACHS Adult and Child Surveys.

1.3.1 Landline Frame

The sample of landline telephone numbers was provided by Survey Sampling, Inc. (SSI). The frame was defined by exchanges assigned to LA County (county FIPS code 06037). A complete file of directory-listed residential numbers from the Donnelley Quality Index3 (DQI3) Database was used by SSI to remove 100-banks from the frame if they contained zero residential listings (0-banks). The resulting frame contained all 100-banks from exchanges that serve LA County with at least one residential listed telephone number (1+banks). All telephone numbers (listed and unlisted) in the 1+banks were eligible for selection. This is known as a list-assisted landline frame. The list-assisted method is generally thought to be subject to some small coverage bias (because of unlisted residential numbers in banks that contain no listed residential numbers), but this slight bias is offset by gains in survey efficiency and lower cost. The list-assisted method was used for the LACHS.

Known business telephone numbers were purged from the landline sample after selection and before calling attempts were made. This was done by the sample provider, SSI, by comparing the sampled telephone numbers to listed business directories. The landline sample was stratified for the Adult and Child Surveys. Sampled landline telephone numbers were randomly grouped into sets of replicates for controlled release. All records in a replicate were released at one time.

1.3.2 Cellular Frame

SSI also provided the sample of cellular (or wireless) telephone numbers. The SSI wireless sampling frame begins with 1,000-blocks constructed from exchanges that provide cellular telephone service as designated in the Telecordia Terminating Point Masterfile (TPM). The frame of 1,000-blocks is then expanded to the 100-block level to identify and remove "mixed use" 100-blocks, or those that include landline numbers. The result is a sampling frame of cellular 100-blocks that is mutually exclusive of the list-assisted landline sampling frame. A county FIPS identifier is included for all telephone numbers in the cellular frame, thus the cellular frame for the LACHS only included telephone numbers that were assigned to the LA County FIPS (06037). County FIPS is assigned to cellular numbers based on the rate center of the cell phone exchange.

The cell phone sample was stratified for the Adult and Child Surveys. Telephone numbers were randomly drawn from the cellular sampling frame for the Adult Survey and Child Survey, with each telephone number having a known and equal probability of selection. Sampled cell phone numbers were randomly grouped into sets of replicates for controlled release. All records in a replicate were released at one time and fully dialed according to the call protocol. All telephone numbers from the cellular frame were manually dialed in accordance with laws that prohibit cell numbers from being called by an automated dialer. The sample of cell numbers were processed through SSI's GeoID process to append billing ZIP code (when available) and an activity flag that indicates whether the number is likely to be assigned and working.

Two types of available sources of information were used to evaluate options for stratification to improve geographic targeting ability and productivity of cell phone samples:

1) ***Rate centers.*** Rate center represents the geographic area ("rate area") assigned to a telephone exchange (or 1000-bank) for billing purposes. Rate center is not always strongly associated with residence because people do not always get telephone numbers with rate centers where they live, and people can move without changing their cell number. Still, rate center approximates the geographic location where the cell number was originally assigned, and while not perfect, it is considered a rough indicator of location.
2) ***Billing ZIP***. Survey Sampling, Inc., the sample vendor, has a GeoID post-selection matching service that appends billing ZIP code (ZIP code where the cell phone bill is sent) for some telephone numbers that became available in 2012. When a cell phone number matches to the database, the accuracy of the geographic location generally performs better than rate centers. However, only a portion of sampled numbers produces a match, and the "match rate" varies substantially by geography.

Abt used both sources of information to evaluate stratification options in the cell frame. Rate center is used to define the cell phone frame, with rate centers that fall within LA County included.

1.4 Adult Survey

The 2018 Adult Survey was originally designed to include a sample of at least 8,000 adults, with a minimum of 500 in each of the eight (8) LA County Service Planning Areas (SPAs), which are defined geographically by census tracts. Due to increasing costs associated with data collection, the target sample size was modified to 7,000 adults, with a minimum of 500 in each SPA. A dual frame overlapping design was used to conduct the survey, including:

(1) A random-digit-dial (RDD) sample frame of landline telephone numbers in LA County, and
(2) A cross-sectional, RDD cell phone sample frame of telephone numbers from LA County (based on county of the billing office).

The sample design is referred to as "overlapping" because households that have both landline and cell telephone service have a probability of being selected from both frames. The degree of "overlap" between the frames is accounted for in the weight calculations. Telephone numbers from each frame were managed independently.

Screening procedures differed for the landline and cell frames. In households contacted from the landline frame, one adult was randomly selected to participate in the interview. In the cell frame, the adult who answered the phone was invited to participate after determining eligibility since cell phones are generally considered personal, not household, devices.

A total of 7,002 interviews were completed for the LACHS Adult Survey, including 3,139 landline interviews and 3,863 cell interviews. Upon completion of case geocoding, 36 adult respondents were determined to have incorrectly identified themselves as LA County residents. The final, geocoded number of adult interviews was 6,966, including 3,163 landline interviews and 3,803 cell phone interviews. A total of 40.5% (n=2,822) of all interviews were conducted with cell phone only households, without a landline telephone[1].

1.4.1 Adult Landline RDD Telephone Sample

The landline sample consisted of five strata:

1) a Los Angeles County cross-section,
2) a SPA 1 oversample of telephone numbers,
3) a SPA 4 oversample of telephone numbers,
4) a SPA 5 oversample of telephone numbers, and
5) a SPA 7 oversample of telephone numbers.

A pure random sample of ten-digit telephone numbers was drawn from each stratum, with each number having a known and equal probability of being selected (also known as an Equal Probability of Selection Method sample). For sample release purposes, telephone numbers were grouped into replicates of 500 for the cross-section and 100 for the SPA oversamples, with all telephone numbers in a replicate released at the same time. Although the SPA 1, SPA 4, SPA 5,

[1] Adult Survey question 69.

and SPA 7 oversample records overlap with a County cross-section, telephone numbers were drawn from separate sample pulls and deduplicated, or deduped, as needed.

In order to identify telephone exchanges for the SPA oversamples, census tract-exchange reports were run showing the number of directory-listed telephone numbers in each telephone exchange that fall inside versus outside the census tracts that define the SPAs. For SPA 1, exchanges were selected at an 80% coverage rate (ratio of the number of telephones based on chosen exchanges that fall within the SPA to the total listed numbers within the SPA) and an 82% hit rate (the expected incidence of households of all chosen exchanges that fall inside the SPA)[2]. For the SPA 4 oversample, exchanges were selected at a 75% coverage rate and an 83% hit rate. For the SPA 5 oversample, exchanges were selected at an 80% coverage rate and an 85% hit rate. For SPA 7, all exchanges were selected for the oversample. These exchange reports can be found in Appendix I-A, Appendix I-B, Appendix I-C, and Appendix I-D, respectively.

[2] Please see Appendix I-A for a definition of this calculation.

1.4.2 Adult Cellular RDD Telephone Sample

An Equal Probability of Selection Method sample of telephone numbers was randomly drawn from the cellular sampling frame for the Adult Survey, with each telephone number having a known and equal probability of selection. The sample was randomly assigned into replicates of 500 telephone numbers for sample release purposes, with all telephone numbers in a replicate released at the same time. All telephone numbers from the cellular frame were manually dialed in accordance with laws that prohibit cell numbers from being called by an automated dialer.

When we reached an eligible adult, who resided in LA County from the cellular frame, we attempted to conduct the full Adult Survey with that individual. The cellular telephone was treated as a personal device, not a household device, so the adult who answered the telephone was considered the respondent for the survey instead of randomly selecting an adult from the household as was done in the landline sample.

1.5 Child Survey

The 2018 LACHS Child Survey was originally designed to include a sample of at least 6,000 LA County households with at least one child under the age of 18 years, with a minimum sample size of 500 interviews in each of the eight SPAs. Due to increasing costs associated with data collection, this target sample size was modified to include at least 5,000 LA County households with at least one child under the age of 18 years, with the same minimum sample size of 500 interviews in each of the eight SPAs. In households with multiple children, one child was randomly selected to be the focus of the survey questions. The survey was completed by an adult who knows the child "well enough to answer questions about his/her health, his/her doctor visits, what kinds of foods he/she eats, and his/her general activities." This is the same criteria implemented for the 2015 wave of the Child Survey.

A total of 5,010 interviews were completed for the LACHS Child Survey. After DPH completed case level geocoding, 24 respondents were determined to have incorrectly identified themselves as LA County residents. The final number of 4,986 child interviews were completed from four sample sources:

1) Adult Survey Completes from the Landline Frame (n=371 interviews)
   - All respondents that completed the Adult Survey and reported having at least one child under the age of 18 years in the household were invited to participate in the Child Survey immediately afterwards. An adult sufficiently knowledgeable about the health and daily routines of the focus child, either the original respondent or another adult household member, was invited to complete the interview.
2) Adult Survey Completes from the Cellular Frame (n=746 interviews)
   - If the Adult Survey respondent reported having at least one child under the age of 18 years in the household, an adult sufficiently knowledgeable about the health and daily routines of the focus child was asked to complete the interview.
3) Supplemental Landline RDD Sample (n=2,117 interviews):

- An independent sample of landline RDD telephone numbers was drawn to screen households for the presence of at least one child under the age of 18 years. After determining household eligibility, an adult in the household sufficiently knowledgeable about the health and daily routines of the focus child was asked to complete the interview.

4) Supplemental Cellular RDD Sample (n=1,752 interviews)
   - This was an independent list of Cellular RDD telephone numbers drawn to screen households for the presence of at least one child under the age of 18 years. After determining eligibility, an adult sufficiently knowledgeable about the health and daily routines of the focus child was asked to complete the interview.

1.5.1 Child Survey Oversampling Design and Interview Goals

During the survey design, we proposed a sampling methodology for the 2018 LACHS Child Survey similar to the 2015 LACHS methodology. While households with children that completed the Adult Survey were eligible to complete the Child Survey, it was also necessary to include a supplemental RDD sample of landline and cellular telephone numbers that would be screened for the presence of children.

A total of at least 5,000 interviews were to be completed with parents, guardians, or adults sufficiently knowledgeable about the health and daily activities of children less than 18 years of age residing with them, with at least 40% of interviews completed with cell phone only (CPO) households. Of the final 4,986 Child Survey interviews, 38.0% (n=1,893) were conducted with cell phone only households, without a landline telephone[3].

1.5.2 Child Survey Supplemental Landline RDD Telephone Sample

The supplemental landline frame for the Child Survey was defined the same way as the Adult Survey landline cross-section: exchanges assigned to LA County, including 100-banks with 1 or more directory-listed telephone numbers using the list-assisted method (see Adult Landline RDD Telephone Sample).

The LACHS started with a largely county-wide cross-section, and we knew we had to oversample within SPAs to achieve the minimum sample sizes. The supplemental landline sample for the Child Survey consisted of five strata, defined by exchanges that were designed to target:

1) a Los Angeles County cross-section,
2) a SPA 1 oversample of telephone numbers,
3) a SPA 4 oversample of telephone numbers,
4) a SPA 5 oversample of telephone numbers, and
5) a SPA 7 oversample of telephone numbers.

A pure random sample of ten-digit telephone numbers was drawn from each stratum with each number having a known and equal probability of being selected. Although the SPA 1, SPA 4, SPA

[3] Child Survey question CN77a.

5, and SPA 7 sample definitions overlap with the original county-wide cross-section, they were drawn from separate sample pulls and deduplicated with the cross-section as needed. There was no overlap between the SPA 1, SPA 4, SPA 5 and SPA 7 oversamples. Within each stratum, telephone numbers were randomly assigned into replicates, with all telephone numbers in a replicate released at the same time. The SPA oversamples for the Child Survey were defined the same way as for the Adult Survey.

1.5.3 Child Survey Supplemental Cellular RDD Telephone Sample

An Equal Probability of Selection Method sample of telephone numbers was randomly drawn from the cellular sampling frame for the Child Survey, with each telephone number having a known and equal probability of selection. The sample was randomly assigned into replicates of 500 telephone numbers for sample release purposes, with all telephone numbers in a replicate released at the same time. All telephone numbers from the cellular frame were manually dialed in accordance with laws that prohibit cell numbers from being called by an automated dialer.

1.5.4 Selecting a Focus Child for the Child Survey

The number and age of children was assessed during the Adult Survey, and eligible households were invited to participate in the Child interview at the completion of the Adult Survey. If the respondent who completed the Adult Survey was not sufficiently knowledgeable about the selected child, we asked for a sufficiently knowledgeable adult who resided in the household to continue the interview. In the supplemental landline and cellular RDD samples, we first assessed eligibility of the household by completing the screener with an adult and then we asked for the sufficiently knowledgeable adult to complete the interview about the selected child.

In order to ensure the sample of focus children from the Child Survey interview was representative of the population, we randomly selected one child from each household. The Adult Survey questionnaire and the Child Survey screener determined the number of children in each household who were: (1) 12 to 17 years of age, (2) 6 to 11 years of age, and (3) 5 years of age or younger. The children were enumerated as first oldest, second oldest, etc. within each category. We then selected one child to be the focus of the interview (see section 3.2 for child selection procedure).

2. Structure and Content of the Adult Survey

The outline of the structure and general content of the 2018 LACHS Adult Survey questionnaire is provided below.

2.1 Adult Survey Screener

After explaining that we were calling on behalf of the LAC DPH to conduct the LACHS Survey, different screening procedures were used for the landline and cell phone samples.

In the landline sample, after reaching an adult aged 18 years or older he/she was asked a series of questions to determine whether the household was located within LA County and qualified to participate. After confirming household eligibility, an inventory of the adults residing in the household was taken. In households with more than one adult, the CATI program randomly selected one adult to complete the survey based on respondent selection procedures described below. If the CATI program selected a different adult to come to the phone than the individual who answered the screener questions, we determined the language required to communicate with the new respondent and scheduled a callback if necessary. Once the new respondent was on the phone, the interviewer introduced herself/himself and explained the purpose of the call.

Individuals contacted from the cellular phone sample were required to confirm residency in LA County, in addition to questions that confirm: (1) the respondent was not currently driving, (2) was at least 18 years of age, (3) that the phone number we had reached was the number we sampled, and (4) that the number we dialed was a cellular phone. Since cell phones are considered personal devices (as opposed to a household device), the individual who answered continued with the interview after successfully answering all the screener questions.

When requested, interviewers provided respondents with a contact phone number for the LAC DPH to verify the legitimacy of the study or ask any other study-related questions that the interviewer could not answer.

2.2 Landline Sample Respondent Selection Procedure

As stated in the previous section, the landline screener questions enumerated adult residents of the household in order to randomly select one adult to be interviewed. In households with only one adult resident, the interview was attempted with that adult. In households with more than one adult, the CATI script applied an equal probability selection of one adult.

In households with two adults, either the respondent who completed the screener questions or the other adult was selected. If the other adult was selected, we asked to speak to him or her directly to recruit participation in the survey or schedule a callback if needed.

In households with three or more adult residents, the person who completed the screener had the same probability of being selected as any other adult in the household. For example, in a household with three adults, there was a 1 in 3 (33%) probability that the person who completed the screener would be selected. If the respondent who completed the screener was selected, the interview continued. If another adult was selected, we determined who the selected respondent was by asking

for the person who had the "most recent birthday." Once the selected adult was identified, and if available, the interview was attempted; if unavailable, all subsequent attempts to contact that household were made with the goal of speaking to and conducting the interview with that adult.

2.3 Adult Survey Main Questionnaire

The Main section of the Adult Survey included a core set of more than 250 questions, not including questions from the subsample sections. However, due to skip patterns, not every core question was applicable to or asked of every respondent.

Respondents from the landline frame were asked for their home address for the purpose of geocoding the address. Respondents from the cell phone frame were asked for their mailing address to issue their incentive. If the mailing address for the incentive was their home address, that address was also used for geocoding otherwise home address or cross-streets were asked for geocoding.

In September 2018, an interviewer note was added to the flu vaccine question (Q38) indicating that if the respondent said a "flu spray" or "flu mist" was received, it should be recorded as a "Yes" response to this question. This was done in response to the Advisory Committee on Immunization Practices recommendation to include FluMist as an option for influenza vaccination during the 2018-2019 flu season.

2.4 Additional Questions Asked of Subsamples of Adults

Seven "subsample" modules were also included in the Adult Questionnaire. Each module consisted of a block of questions and was administered to approximately one-seventh of the sample (1,000 interviews). The CATI script randomly assigned each respondent to one of the seven subsample groups at the beginning of the survey. Each subsample module was programmed at a point within the Adult Questionnaire based on topic to ensure that the survey would flow in a cohesive manner.

3. Structure and Content of the Child Survey Questionnaire

3.1 Survey Screener

Eligibility requirements for the Child Survey included residing in LA County and having at least one child under the age of 18 years in the household. Child Survey interviews originated from completed Adult Survey interviews (landline or cellular RDD samples) or from the supplemental landline or cell phone RDD samples. Eligibility was established differently for each sample source.

Adult Survey respondents were required to confirm residency in LA County to be eligible for the interview. Because the Adult Survey asks about the presence of children in the household, the interview itself determined eligibility for the Child Survey. However, fully completing the Adult Survey was a third eligibility requirement unique to this group only.

In the supplemental landline and cell phone RDD samples, the interviewer began by explaining that we were calling to conduct the LACHS Child Survey on behalf of LAC DPH and asked to speak to an adult. As with the Adult survey, respondents in the cell phone frame were screened for safety and confirmation that we had reached their cell phone. An attempt was then made to screen the household to determine eligibility by asking:

1. If the household was located in LA County, and if so in what city or town, and
2. How many children lived in the household who were: (1) 12 to 17 years of age, (2) 6 to 11 years of age, or (3) 5 years of age or younger.

Once eligible households were identified, a child was chosen at random to be the focus of the survey, and we attempted to complete the interview with an adult in the household who was sufficiently knowledgeable about the health and daily routines of the selected child.

3.2 Respondent and Child Selection Procedure

After determining eligibility, the CATI script calculated the total number of children in the household based on answers to questions about the number of children who were: (1) 12 to 17 years of age, (2) 6 to 11 years of age, and (3) 5 years of age or younger. The CATI script enumerated all children in the household by age group, and order of age within groups. For example, a household with two children in each age category would have a child selected at random. The selected child was identified to the respondent by age group and position within that group, e.g. second oldest.

In October 2018, in consultation with LAC DPH, a process of oversampling children 0 to 5 years of age was implemented to increase the number of interviews focusing on young children. The oversampling process instituted involved always selecting a child age 0 to 5 years when at least one was present in a household.

Once a focus child was selected, we attempted to identify and speak directly with an adult in the household sufficiently knowledgeable about the health and daily routines of the focus child. If this required a new adult to be brought to the phone, we determined the language required to

communicate with the new respondent and scheduled a callback if necessary. Once the new respondent was on the phone, the interviewer would repeat the introduction and explain the purpose of the call before confirming that this new adult was knowledgeable about the health and daily routines of the focus child. Once the appropriate adult was identified, we attempted to recruit participation in the Child Survey. For eligible respondents who had completed the Adult Survey, we administered the Child Survey in the same language as the Adult Survey.

3.3 Child Survey Questionnaire

The Child Survey questionnaire contains over 200 individual questions, though most of these questions were not asked of all respondents. Many questions were only asked in interviews where the selected focus child was 5 years of age or younger. Interviews conducted about a selected child age 6 to 17 years of age were approximately five minutes shorter by comparison. Child interviews that originated from Adult Survey completed interviews were also shorter, as some of the questions had already been answered in the Adult Survey.

In September 2018, an interviewer note was added to the flu vaccine question (CN38) indicating that if the respondent said a “flu spray” or “flu mist” was received, it should be recorded as a “Yes” response to this question. This was done in response to the Advisory Committee on Immunization Practices recommendation to include FluMist as an option for influenza vaccination during the 2018-2019 flu season.

4. Survey Administration

4.1 Pre-testing and Pilot Test

The LACHS was designed to include both a questionnaire pre-test and pilot test. A total of 30 Adult and 30 Child Survey pre-test interviews conducted in English only would provide feedback to gauge interview length, determine if revisions were necessary to question wording and/or question order, and assess the general ease of administering the surveys. After the English-language versions of the Adult and Child Surveys were finalized, they would be translated and a pilot test including 50 Adult and 50 Child Survey interviews would be conducted, with a minimum of 10 Spanish language interviews each for the Adult and Child Survey. Final recommendations for questionnaire and protocol revisions would be provided based on the pilot test interviews before the start of the main study.

4.1.1 Pretest

Abt Associates conducted a pretest of the 2018 LACHS beginning on August 2, 2017. Interviewing began with the Adult Survey. The Child Survey required a program correction before interviewing began on August 3, 2017. The pretest was conducted in English and dialed solely from the landline sample frame. The pretest concluded on August 9, 2017, resulting in thirty Adult interviews and thirty Child interviews.

The average length of the Adult interview was 29:00[4] minutes. The average length of the Child interview was 18:47 minutes.

4.1.2 Pilot Test

Abt Associates conducted a pilot test of the 2018 LACHS beginning on August 29, 2017. The pilot was dialed in both English and Spanish. Interviewing began with the Child Survey. LAC DPH and Abt Associates decided to delay the start of the Adult Survey, pending additional revisions to the questionnaire and CATI scripts. Interviewing on the Adult Survey began on August 31, 2017. Spanish dialing began on September 5, 2017 for the Child Survey and on September 11, 2017 for the Adult Survey.

The Fort Myers Call Center was temporarily closed from September 8-13, 2017 due to Hurricane Irma. Abt Associates and LAC DPH agreed to suspend dialing from September 8-11, 2017. When the closure of Fort Myers extended beyond September 11, 2017, the project team decided to train the McAllen, TX Call Center to dial LACHS. This contingency plan allowed McAllen to focus on completing Spanish language interviews. McAllen was trained and began dialing on September 15, 2017. The pilot concluded on September 18, 2017, resulting in fifty-nine Adult interviews, averaging 29:26 minutes and fifty-nine Child interviews, averaging 19:30 minutes.

[4] This overall timing includes two outliers, which measured 42:06 and 47:15. If these outliers were removed, the average timing for the Adult interview was 27:43.

4.2 Adult Survey Questionnaire Revisions

The Adult Survey questionnaire pretest and pilot test indicated the interview was longer than budgeted. The LAC DPH technical team spent the second half of September and the first half of October 2017 meeting with their stakeholders to determine which questions could be removed. When DPH provided Abt with the questions to be removed, subsample 4 was left with just one question (neighborhood safety). DPH and Abt agreed to move that question into subsample 8, leaving the 2018 LACHS Adult Survey questionnaire with seven subsamples.

4.3 Data Collection Subcontractors

To accommodate the volume of interviewer labor hours required to complete the 2018 LACHS, Abt realized it would again require assistance from data collection subcontractors.

Americas Survey Company (ASC) in Chula Vista, California is a regular data collection subcontractor for Abt. ASC provided data collection support for the 2015 LACHS. Across all data collection, ASC completed 1,144 interviews.

Van Nuys, California data collection firm, Interviewing Service of America (ISA) was also contracted to conduct telephone interviews, with a specific focus on Asian language interviews. It was hoped by both Abt and ISA that their location in LA County and experience with conducting Asian language interviews would produce more interviews completed in Cantonese, Mandarin, Korean, and Vietnamese than were completed in these languages in past waves of the LACHS. Unfortunately, it did not. In a post data collection debriefing, ISA cited the heavy reliance on cellular phones for reaching respondents who primarily speak the languages of interest and the overall difficulty in reaching respondents of all races, ethnicities, and languages on cellular phones. Across all data collection, ISA completed 124 interviews.

4.4 Survey Interviewing Dates

For the 2018 LACHS Child Survey, interviews were conducted from January 17, 2018, through March 26, 2019. LACHS Adult Survey interviews were conducted January 17, 2018, through March 25, 2019.

From November 8-21, 2018, a wildfire (Woolsey Fire) burned in LA County, prompting evacuations and causing extensive damage. Due to the impact of the fire, LAC DPH requested suspending dialing for the LACHS in the affected areas. Abt suspended dialing in 24 zipcodes in Northerwest LA County (including Malibu, Calabasas, Westlake Village, Agoura Hills, Topanga, Woodland Hills). Due to the extent of the damage, evacuations, and recovery efforts, dialing in the affected areas did not resume until January 11, 2019.

4.5 Average Length of Interviews

The Adult Survey was specified and budgeted to average 25 minutes in length; the Child Survey was specified and budgeted to average 20 minutes in length.

4.5.1 Adult Survey Average Length

At the end of data collection, the average Adult interview length was 30:59 minutes, longer than the 2015 length of 27:28 minutes. The average lengths by category were:

- Landline: 28:05[5]
- Cell phone: 33:22
- Subsample 1: 29:23
- Subsample 2: 30:42
- Subsample 3: 31:02
- Subsample 5: 30:50
- Subsample 6: 31:52
- Subsample 7: 31:31
- Subsample 8: 31:34

4.5.2 Child Survey Average Length

By the end of data collection, the average Child Survey interview length was 21:35 minutes, shorter than the 2015 length of 23:47 minutes. The average lengths by category were:

- Landline: 19:47[6]
- Cell phone: 23:43
- Selected Child age 0-5: 25:08
- Selected Child age 6-11: 19:50
- Selected Child age 12-17: 20:20

4.6 Survey Languages

Residents of LA County are racially and ethnically diverse, with large populations of Hispanics/Latinos and Asians. A notable percentage of these Hispanic and Asian residents speak little or no English. To ensure these populations could be included in the 2018 Adult and Child Surveys, both were administered in five non-English languages: Spanish, Cantonese, Mandarin, Korean, and Vietnamese.

The percent of interviews completed in each language for the Adult and Child Surveys is shown in the table below.

Table 1: Adult and Child Survey Interviews by Language

Language	Adult Survey		Child Survey	
English	5,685	81.6%	3,622	72.6%
Spanish	1,188	17.1%	1,340	26.9%
Cantonese	2	0.0%	7	0.1%

[5] The 2015 Adult Survey average interview lengths by frame were Landline 26:35, Cell Phone 29:18.

[6] The 2015 Child Survey average interview lengths by frame were Landline 22:25, Cell Phone 26:14.

Mandarin	26	0.4%	6	0.1%
Vietnamese	22	0.3%	4	0.1%
Korean	43	0.6%	7	0.1%
TOTAL	6,966	100.0%	4,986	100.0%

English and Spanish surveys were administered directly in the CATI program. Cantonese, Mandarin, Vietnamese, and Korean interviews were administered using the paper questionnaire, with answers entered directly into the CATI program while following along an English version of the interview.

4.7 Translation and Translation Review

After the English-language versions of the Adult and Child Surveys were finalized, both surveys were translated into each of the additional five languages in which the survey was offered. Spanish language translations were done in-house by Abt Associates. Asian language translations were done by G3 Translate, a New York City-based firm with the ability to translate into the four Asian languages, and was the firm contracted for the 2015 LACHS translations. The translated versions of the 2015 LACHS survey questionnaires were provided to the vendor to ensure that the existing translation would be used for questions that were identical to the 2015 survey. To facilitate this process, the 2018 English-language versions of the questionnaires were marked-up to indicate which questions were unchanged from the 2015 surveys. The marked-up questionnaires were provided to the translation vendor.

The completed translations were reviewed by Abt and ISA interviewers fluent in the respective languages; additionally, DPH staff fluent in the languages also reviewed the translations. All feedback from the three organizations (DPH, Abt, and ISA) were provided to G3 Translate for an internal review and response. Final review of the Spanish tranlastions was done by Abt and DPH, while final review of the Cantonese, Korean, Mandarin, and Vietnamese translations was done by DPH, Abt, and ISA.

4.8 Sample Management

The sample was managed to complete the desired number of interviews overall and in each SPA while achieving the highest response rate possible. This was done by releasing sample in batches of replicates, ensuring released sample was fully dialed according to the call protocol, monitoring refusal conversion efforts, and periodically assessing productivity to estimate the amount of sample needed to reach quotas before releasing additional sample replicates.

4.9 Call Design and Protocol

Telephone numbers were given a maximum of 10 call attempts for both the Adult and Child Surveys. Cases that completed the Adult Survey and were eligible to complete the Child Survey were given up to 10 additional attempts (for up to 20 attempts total).

Outbound calls for LACHS were concentrated in the core dialing windows below:

- Weeknights 5PM-9PM[7]
- Saturdays 10AM-4PM
- Sundays 1PM to 9 PM

If contact was not established during the regular dialing windows, landline numbers were also called on weekdays during the day (roughly noon to 5pm) on the 3rd and 8th attempts. This schedule ensures that calls are made to households at different times of the day to maximize the chance of reaching the household.

Messages were left the first time a voicemail/answering machine message was encountered and then on every third subsequent voicemail/answering machine message. The following answering machine messages were used:

Landline

> "Hello, I'm calling on behalf of your Los Angeles County Department of Public Health. This is not a sales call. We are conducting an important survey of County residents. If you have any questions about the survey, you may contact the Los Angeles County Department of Public Health at 213-288-8727. We will try reaching you another time."

Cell Phone

> "Hello, I'm calling on behalf of your Los Angeles County Department of Public Health. This is not a sales call. We are conducting an important survey of County residents. If you qualify, you will be reimbursed for time spent answering our questions on your cell phone. If you have any questions about the survey, you may contact the Los Angeles County Department of Public Health at 213-288-8727. We will try reaching you another time."

A LAC DPH telephone number was programmed to be displayed on caller ID for calls made to landline phones for this survey. This was done so that households would reach the LAC DPH if the number was called back to inquire about the purpose of our call. This was not possible with cell phones due to accordance with laws that prohibit cell numbers from being called by an automated dialer.

4.10 Cellular Telephone Sample Targeting

In response to an October 2018 conference call and exchange of communications with DPH, Abt undertook an effort to better target LACHS cell phone outreach for specific subgroups (Asian Americans, families with children aged 0-5 years, and adults aged 18 to 64 years). Abt Data Scientists initiated a three-tier process.

First, available phone numbers would be matched to additional data via a frame vendor. SSI collects additional information such as billing zip code, household composition, demographics, and other indicators. Abt sent approximately 286,000 cell phone numbers for them to pull this additional data. We matched those data with our existing completes to assess quality and to form composite outcomes in the target subgroups.

[7] All times are Pacific.

Second, a subsample of the data (mostly those not matched to SSI records) were sent to a second vendor who specializes in voter registration data, Aristotle International. Matches to phone numbers were made within those data and again our team performed quality checks and formed composite outcomes based on the subgroups of interest. Based on any source geographic data (e.g. billing zip code or Census FIPS) we appended recent Census data from that region.

Third, Abt employed machine learning models to predict likelihood that phone numbers fell into one of our subgroups of interest. We removed phone numbers that did not fit within the parameters of our predictive models (e.g. numbers for which no matches were available from survey vendor or voter records). These telephone numbers were analyzed using random forest models to identify the numbers most likely to be associated with households of interest.

This three-tier process identified 38,276 cellular telephone numbers to be targeted for additional call attempts. This recruitment effort resulted in the completion of 246 Adult Survey and 38 Child Survey interviews.

4.11 Refusal and Refusal Conversion Procedures

Initial refusals by the household or respondent were classified as "soft" or "hard" (harsh) refusals. Hard refusals were not called again. Soft refusals were called again by an interviewer trained in refusal conversion techniques to try and gain cooperation of the household/individual. If the household or individual was reached and refused a second time, no further calls were made.

4.12 Incentives

Respondents who completed only the Adult interview on a landline phone or only the Child interview from the supplemental landline sample were not offered an incentive. A $10 incentive was offered to: respondents who completed the Adult interview or Child interview by cell phone; and those who completed the Child interview after completing the Adult interview on a landline. Those who completed both the Adult and Child interviews on a cell phone were offered a total of $20.

In December 2018, Adult Survey respondents qualifying for the Child Survey were offered $50 to continue and complete the Child Survey interview. The amount of the Child Survey continuation respondent remuneration was increased in order to improve the cooperation and completion rates among the eligible respondents. Thus, cell phone respondents who completed the Adult Survey could have received up to $60 for completing both interviews.

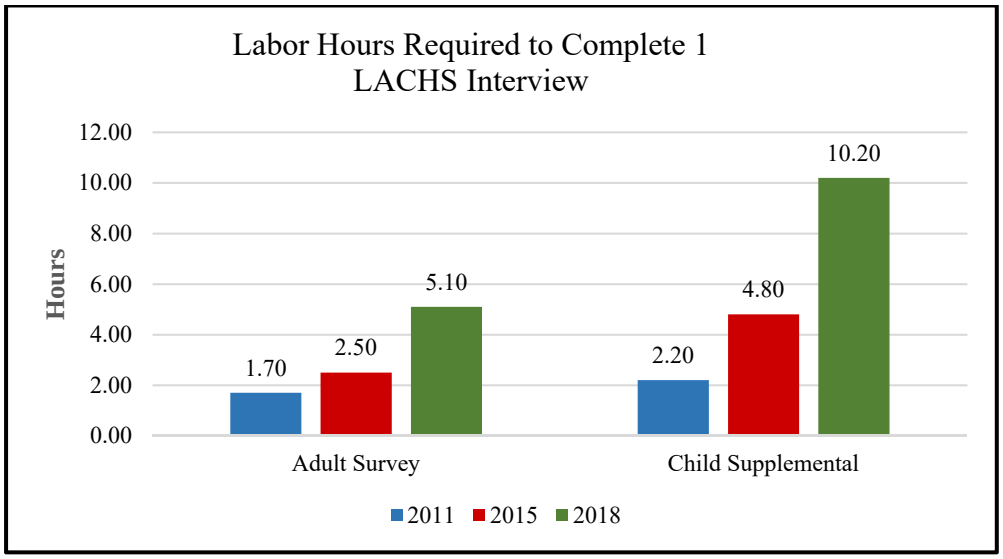
4.13 Labor Hours per Completed Interview

By 2019, the deterioration of the RDD sample frame has become an issue for all telephone data collection; RDD telephone surveys have reached a crossroads. One result of increased RDD telephone survey nonresponse is a higher cost of data collection. A 2017 American Association for Public Opinion Research (AAPOR) report concluded "we expect that over time, fewer and fewer surveys will be conducted using only the telephone for sampling, recruiting, and data collection and that there will be more surveys that use the telephone for some, but not all, of their recruiting and data collection needs; whereas proportionally fewer surveys will use a telephone

frame for coverage and sampling purposes[8]." The more than 200% increase in labor hours per completed interview, resulted in significant increases in the costs of completing telephone interviews for both the Adult and Child surveys. A cap on LACHS funding did not allow Abt and LAC DPH to increase the LACHS budget to cover completing the originally planned 8,000 Adult and 6,000 Child interviews.

The following chart details the decline of response in the RDD telephone surveys and the impact on the labor hours required to complete LACHS interviews over the last three survey waves.

Chart 1: LACHS Interviewer Labor Hours per Completed Interview



[8] AAPOR: "The Future of U.S. General Population Telephone Survey Research".

5. Final Data Preparation

5.1 Data Processing

Data for the Adult and Child Surveys were processed periodically throughout data collection. Processing involved a compilation of completed interview cases for review by the Project Manager.

Final Data Cleans

Language of Interview

During data collection, Abt learned data collection subcontractor ISA experienced cases of telephone interviewers incorrectly recording the language of the Asian language interviews. The CATI software used for this wave of the LACHS, as well as the previous two waves, was not capable of displaying the letters and/or characters in the LACHS Asian languages (i.e., Cantonese, Korean, Mandarin, and Vietnamese). Thus, Asian language interviewers administered the interview in CATI following along with the printed questionnaire document in the appropriate language. The Asian language interviewers read the question and, when appropriate, response options from the printed paper questionnaire. There were instances when the interviewers recorded the language of the interview as the language on the CATI system screen (i.e., English), rather than the language of the paper questionnaire. The discrepancy was caught when comparing the survey data and CATI reports of interviews completed by language by organization against both the data collection summary reports and invoices submitted by ISA. Because paper scripts were used for the Asian language interviewing, a manual review of completed interviews was conducted. The manual tally of completed Asian language interviews matched the data collection reports and the invoices. Case level cleans were then written and executed to correct the language of conducted interview.

Upon learning of this issue, Abt's technical team and Call Center staff worked with ISA to make sure the appropriate language in which the interview was conducted was recorded in the CATI system. Abt's LACHS Project Manager notified the DPH technical team of this issue during a biweekly status report tele-meeting. During this verbal discussion, it was agreed that Abt would provide DPH a list of proposed data cleans to correct the data and code the appropriate language of the interviews. After data collection was completed, Abt provided a list of 118 proposed data cleans for the language of interview. DPH's technical team approved the data cleans on April 8, 2019.

Which Tobacco Product(s) did the Respondent Try First (QN45ii)

Post data collection and data delivery, DPH reported cases with missing data from Adult Survey question QN45ii. Based on the questionnaire's logic, 588 respondents should have been asked which type(s) of tobacco product(s) they first tried. Upon review, Abt determined 238 cases were missing data for QN45ii. In all 238 cases identified, the respondents were every day/nearly every day cigarette smokers, used an e-cigarette in the past 30 days, and/or smoked a menthol cigarette in the past 30 days. Therefore, information for this question was lost due to error in CATI programming.

5.2 Geocoding

Home address and cross-street information was collected from respondents for coding SPA and Health District. LAC DPH undertook the entire geocoding effort using the raw data provided in batches by Abt throughout the course of data collection. DPH's geocoding was led by the Population Health Assessment Unit staff.

6. Response Rate and Disposition of Call Attempts

The underlying principle in the calculation of a standardized AAPOR response rate is full disclosure of the method used to calculate the response rate. There are many ways to calculate a survey response rate, as surveys differ and there are alternative ways of thinking about and coding final dispositions.

The 2018 LACHS response rate calculations are based on the April 2015 AAPOR Standard Definitions[9] as was done for the 2015 LACHS.

6.1 Call Disposition Process

During data collection, each call is given a disposition that reflects the outcome of that call. Landline calls may be dispositioned by either the automated dialer (e.g., not in service, busy signal, no answer, etc.) or by interviewers (e.g., callback, refusal, business number, etc.). All calls to cell phones are dispositioned by interviewers. The disposition for each call attempt is recorded and stored in the sample management system (SMS) by a sample ID number. The cumulative history of dispositions for all call attempts are used to assign a single, interim disposition for each sample record. The interim disposition codes are assigned to a priority level when generating the interim (weekly status) or final disposition reports:

> 1=live-non-contact (a working telephone, with no human contact made, e.g. no answer or voicemail/answering machine)
> 2=callback (contact was made with a person, a qualified respondent was not available, the research interviewer scheduled a time to call the phone number again)
> 3=refusal (contact was made with a person, the person answering the call and/or the qualified respondent did not wish to participate)
> 4=completes/resolved (e.g. non-working phones, hard refusals, ineligible phones, businesses, records that have reached their maximum number of call attempts).

The priority level determines what disposition appears on the disposition report based on the following rules:

- Completes/resolved (4) stay that way unless they are dialed again. If they are dialed again the priority level is reset. For example, sometimes records resolved as non-working or over maximum attempts are called again. This may be done in order to complete a few extra interviews without having to release fresh sample. The field duration of the survey may make it reasonable to confirm records that were once non-working are still non-working.
- Refusals (3) keep the last refusal disposition, unless they become completes/resolved (4).
- Callbacks (2) keep the last callback disposition, unless they become refusals (3) or completes/resolved (4).
- Live-non-contacts (1) use the last live non-contact disposition unless they have become callbacks (2), refusals (3) or completes/resolved (4).

[9] http://www.aapor.org/AAPORKentico/AAPOR_Main/media/publications/Standard-Definitions2015_8theditionwithchanges_April2015_logo.pdf

6.2 Calculating Final Disposition Codes from the Case-level Call History

Prior to assigning each record a final, standard AAPOR disposition code, we made several adjustments to some of the records that were dialed in the LACHS samples:

- Defined and identified partial completes and assigned them to a distinct disposition code.
- Identified cases with some data, but not enough to count as Partials, and coded them as Break-Offs.
    - Identified those "Break-offs" which also contained a "Refusal" disposition and assigned them to a distinct disposition code of Refusal and Breakoff.
- Identified those cases which provided an answer of "Don't Know" or "Refused" to one of the Screening questions and assigned them to a distinct disposition code of Refusals to answer screening questions.

Completes

Completed interviews were those cases with a recorded response to the last survey item within the respective version (i.e. Adult Survey or Child Survey).

Partial Completes

Some cases did not answer enough questions to be considered completes; but answered enough to be counted as "Partial Completes." While AAPOR guidelines do not provide specific rules for defining Partials, they do require the criteria used to be documented. We developed criteria for Partials based on the definition used for the 2015 LACHS.

Adult Survey Criteria:

Cases with an answer to question Q38 ("During the PAST 12 MONTHS, have you had a regular seasonal flu shot?") that were not Completes were coded as a "Partial Complete[10]." This question was selected because it is the mid-point of all the commonly asked questions, excluding the Screener/Respondent Selection (i.e. CS1 through S14) and Address Module questions (i.e. all questions after Q91). Having answered at least up to question Q38 would indicate that a respondent had completed a minimum of 50% of the questions common to all respondents of the Adult Survey.

Child Survey Criteria:

Similar to the criteria used for the Adult Survey, we identified Partial Completes in the Child Survey as those cases that did not complete the Child Survey but answered a minimum of 50% of the questions that were common to all respondents of the Child Survey[11]. The question from the Child Survey which was identified as the mid-point of the commonly asked questions was question C53 ("Overall, how easy or difficult is it for (child) to get medical care when (he/she) needs it?").

[10] The 2018 LACHS had 270 Adult Landline Partial and 415 Adult Cell Phone Partial Completes.

[11] The 2018 LACHS had 0 Adult Landline Continuation Partial, 5 Adult Cell Phone Continuation Partial, 99 Child Landline Supplemental Partial, and 88 Child Cell Phone Supplemental Partial Completes.

Break-Offs

Cases that terminated the questionnaire but did not have enough data to be coded as Partials, were coded as Break-Offs. Cases identified as "Break-Offs" which also had a disposition status of "Refused" were recoded into the "Refusal and Break-off" category in the AAPOR disposition.

Adult Survey Criteria:

Cases that (1) qualified for the survey (any household with adults (landline) or adult (cell phone) located in LA County), but (2) terminated the interview before answering question Q38 were coded as Break-Offs.

Child Survey Criteria:

Cases that (1) qualified for the survey (a household in LA County where at least one child under the age of 18 years resided (landline) or an adult with at least 1 child (cell phone)), but (2) terminated the interview before answering question C53 were coded as Break-Offs.

6.3 LACHS Response Rate

Adult Survey

For the Adult Survey, the combined response rates were calculated based on the percentage of full+partially completed interviews, completed from the landline and cell phone frames. For example, 44.5% of interviews were completed in the landline frame and 55.5% of the interviews were completed in the cell frame. Therefore, the combined response rate calculations are: $(RR_{LL}*.445) + (RR_{CP}*.555)$

LACHS Telephone Usage Weighting

3,406	Landline interviews + Partials
4,245	Cell interviews + Partials
7,651	Total Full and Partial Completes
0.445	Landline compositing factor
0.555	Cell compositing factor

Disposition - Response Rates

	Landline	Cell	**Combined**
RR1	4.51%	3.12%	**3.74%**
RR2	4.90%	3.46%	**4.10%**
RR3	12.28%	8.21%	**10.02%**
RR4	13.34%	9.10%	**10.99%**

Cooperation Rate 1	14.39%	20.70%	**17.89%**
Cooperation Rate 2	15.63%	22.94%	**19.69%**
Cooperation Rate 3	61.55%	80.19%	**71.90%**
Cooperation Rate 4	66.85%	88.88%	**79.08%**

Child Survey

For the Child Survey, the combined response rates were calculated as a simple weighted average, summing the proportion of interviews from each sample source by the response rate from that source.

Therefore,

Combined response rate = (RR_{LL}*.071) + ($RR_{LL\text{-}supp}$*.425) + (RR_{CP}*.146) + ($RR_{CP\text{-}supp}$*.358)

Disposition - Response Rates

Response rates for the Landline and Supplement versions are weighted by the percentage of Child interviews completed in each version.

	Landline	LL Supp	Cell	Cell Supp	**Total**
# of completes+partials	368	2,203	754	1,853	**5,178**
% of completes+partials	7.1%	42.5%	14.6%	35.8%	**100%**

	Landline	LL Supp	Cell	Cell Supp	**Combined**
Response Rate 1	4.51%	1.57%	3.12%	1.21%	**1.87%**
Response Rate 2	4.90%	1.64%	3.46%	1.27%	**2.00%**
Response Rate 3	12.28%	15.26%	8.21%	4.78%	**10.27%**
Response Rate 4	13.34%	15.98%	9.10%	5.02%	**10.86%**
Cooperation Rate 1	14.39%	17.96%	20.70%	9.60%	**15.11%**
Cooperation Rate 2	15.63%	18.80%	22.94%	10.08%	**16.06%**
Cooperation Rate 3	61.55%	74.03%	80.19%	72.87%	**73.63%**
Cooperation Rate 4	66.85%	77.52%	88.88%	76.51%	**78.06%**

Adult Survey Response Rates

		Landline	Cell
Interview (Category 1)			
Complete	1.000	3,136	3,830
Partial	1.200	270	415
Eligible non-interview (Category 2)			
Refusal and break-off	2.100	357	3
Refusal	2.110	1,062	522
Break-off	2.120	270	6
Respondent never available	2.210	19	18
Physically or mentally unable/incompetent	2.320	737	448
Household-level language problem	2.331	0	0
Unknown eligibility, non-interview (Category 3)			
Always busy	3.120	1,999	7,816
No answer	3.130	27,742	15,545
Telephone answering device	3.140	17,177	75,286
Call blocking	3.150	286	2,345
Technical Phone Problems	3.160	4	2
Housing unit, Unknown if eligible respondent	3.200	149	304
No Screener Completed	3.210	15,869	39,799
Other	3.900	463	9
Not eligible (Category 4)			
Screen-outs	4.100	190	1,264
Fax/data line	4.200	8,972	440
Non-working/disconnect	4.300	231,900	29,354
Temporarily out of service	4.330	410	6,207
Business, government office, other organizations	4.510	13,351	5,055
No eligible respondent (Child/teen phone)	4.700	0	2,303
Other	4.900	0	166
Total phone numbers used		**324,363**	**191,137**
Completes (1.0)	I	3,136	3,830
Partial Interviews (1.2)	P	270	415
Refusal and break-off (2.1)	R	1,689	531
Non Contact (2.2)	NC	19	18
Other (2.3)	O	737	448
Unknown household (3.12-3.16) - No Contact Made	UH	47,208	100,994
Unknown household (3.20-3.9) - Contact Made	UO	16,481	16,481
Not Eligible: Nonworking, Nonresidential, or Ported (4.2-4.9)	NWC	254,633	43,525
Screen Out: Working and Residential but Not Eligible (4.1)	SO	190	1,264
e1=(I+P+R+NC+O)/(I+P+R+NC+O+SO)		96.9%	80.6%
e2=(I+P+R+NC+O+UO+SO)/(I+P+R+NC+O+UO+SO+NWC)		8.1%	34.6%
AAPOR RR1 =I/(I+P+R+NC+O+UH+UO)		4.5%	3.1%
AAPOR RR2 =(I+P)/(I+P+R+NC+O+UH+UO)		4.9%	3.5%

AAPOR RR3 = I / (I+P+R+NC+O+[e1*e2*UH]+[e1*(UO)])		12.3%	8.2%
AAPOR RR4 = (I+P) / (I+P+R+NC+O+[e1*e2*UH]+[e1*(UO)])		13.3%	9.1%
AAPOR COOP1 = I / (I+P+R+O+[e1*UO])		14.4%	20.7%
AAPOR COOP2 = (I+P) / (I+P+R+O+[e1*UO])		15.6%	22.9%
AAPOR COOP3 = I/((I+P)+R))		61.6%	80.2%
AAPOR COOP4 = (I+P)/((I+P)+R))		66.8%	88.9%
AAPOR CON1 = (I+P)+R+O / (I+P+R+O+NC+UH+UO)		8.4%	4.3%
AAPOR CON2 = (I+P+R+O+[e1*UO]) / (I+P+R+NC+O+[e1*e2*UH]+[e1*(UO)])		85.4%	39.7%
AAPOR CON3 = (I+P)+R+O / (I+P)+R+O+NC		99.7%	99.7%
AAPOR RefRate1 = R/((I+P+(R+NC+O+UH+UO))		2.4%	0.4%
AAPOR RefRate2 = R/((I+P+R+NC+O+[e1*e2*UH]+[e1*(UO)])		6.6%	1.1%
AAPOR RefRate3 = R/((I+P)+(R+NC+O))		28.9%	10.1%

Child Survey Response Rates

		Adult Continuation		Child Supplement	
		Landline	Cell	Landline Supplement	Cell Supplement
Interview (Category 1)					
Complete	1.000	368	749	2,104	1,765
Partial	1.200	0	5	99	88
Eligible non-interview (Category 2)					
Refusal and break-off	2.100	88	204	51	50
Refusal	2.110	0	0	466	397
Break-off	2.120	36	157	122	122
Respondent never available	2.210	0	0	34	65
Physically or mentally unable/incompetent	2.320	0	0	1,142	455
Household-level language problem	2.331	0	0	0	0
Unknown eligibility, non-interview (Category 3)					
Always busy	3.120	0	0	4,169	7,274
No answer	3.130	0	0	62,888	18,136
Telephone answering device	3.140	0	0	31,026	69,472
Call blocking	3.150	0	0	764	2,165
Technical Phone Problems	3.160	0	0	0	0
Housing unit, Unknown if eligible respondent	3.200	0	0	221	375
No Screener Completed	3.210	0	0	30,445	45,425
Other	3.900	0	0	796	4
Not eligible (Category 4)					
Screen-outs	4.100	0	40	12,332	5,746
Fax/data line	4.200	69	0	18,435	260
Non-working/disconnect	4.300	0	0	475,289	28,740
Temporarily out of service	4.330	0	0	650	6,208
Business, government office, other organizations	4.510	0	0	28,004	4,833
No eligible respondent (Child/Teen phone)	4.700	0	0	2	2,145
Other	4.900	0	0	0	163
Total phone numbers used		**561**	**1,155**	**669,039**	**193,888**
Completes (1.0)	I	368	749	2,104	1,765
Partial Interviews (1.2)	P	0	5	99	88
Refusal and break-off (2.1)	R	124	361	639	569
Non Contact (2.2)	NC	0	0	34	65
Other (2.3)	O	0	0	1,142	455
Unknown household (3.12-3.16) - No Contact Made	UH	0	0	98,847	97,047
Unknown household (3.20-3.9) - Contact Made	UO	0	0	31,462	45,804
Not Eligible: Nonworking, Nonresidential, or Ported (4.2-4.9)	NWC	69	0	522,380	42,349
Screen Out: Working and Residential but Not Eligible (4.1)	SO	0	40	12,332	5,746

	Adult Continuation		Child Supplement	
	Landline	**Cell**	**Landline Supplement**	**Cell Supplement**
e1=(I+P+R+NC+O)/(I+P+R+NC+O+SO)	100.0%	96.5%	24.6%	33.9%
e2=(I+P+R+NC+O+UO+SO)/(I+P+R+NC+O+UO+SO+NWC)	87.7%	100.0%	8.4%	56.3%
AAPOR RR1 =I/(I+P+R+NC+O+UH+UO)	74.8%	67.2%	1.6%	1.2%
AAPOR RR2 =(I+P)/(I+P+R+NC+O+UH+UO)	74.8%	67.6%	1.6%	1.3%
AAPOR RR3 = I / (I+P+R+NC+O+[e1*e2*UH]+[e1*(UO)])	77.2%	67.2%	15.3%	4.8%
AAPOR RR4 =(I+P) / (I+P+R+NC+O+[e1*e2*UH]+[e1*(UO)])	77.5%	67.6%	16.0%	5.0%
AAPOR COOP1 = I / (I+P+R+O+[e1*UO])	74.8%	67.2%	18.0%	9.6%
AAPOR COOP2 = (I+P) / (I+P+R+O+[e1*UO])	74.8%	67.6%	18.8%	10.1%
AAPOR COOP3 = I/((I+P)+R))	74.8%	67.2%	74.0%	72.9%
AAPOR COOP4 = (I+P)/((I+P)+R))	74.8%	67.6%	77.5%	76.5%
AAPOR CON1 = (I+P)+R+O / (I+P+R+O+NC+UH+UO)	100.0%	100.0%	3.0%	2.0%
AAPOR CON2 = (I+P+R+O+[e1*UO]) /	100.0%	100.0%	85.2%	49.9%
AAPOR CON3 = (I+P)+R+O / (I+P)+R+O+NC	100.0%	100.0%	99.2%	97.8%
AAPOR RefRate1 = R/((I+P+(R+NC+O+UH+UO))	25.2%	32.4%	0.5%	0.4%
AAPOR RefRate2 =	25.2%	32.4%	4.6%	1.5%
AAPOR RefRate3 = R/((I+P)+(R+NC+O))	25.2%	32.4%	15.9%	19.3%
LACHS Adult Survey Response Rates				
Response Rate 1 = I/(I+P) + (R+NC+O) + (UH+UO)	9.62%	6.47%		
Response Rate 2 = (I+P)/(I+P) + (R+NC+O) + (UH+UO)	10.35%	7.02%		
Response Rate 3 = I/((I+P) + (R+NC+O) + e(UH+UO))	16.97%	11.02%		
Response Rate 4 = (I+P)/((I+P) + (R+NC+O) + e(UH+UO))	18.25%	11.95%		
Adult Survey Child Continuation Survey Participation Rate:	65.60%	65.28%		
Two-Stage Response Rates for Child Survey				
Child Continuation Response Rate 1 = Adult RR1 * Participation Rate	6.31%	4.23%		
Child Continuation Response Rate 2 = Adult RR2 * Participation Rate	6.79%	4.58%		
Child Continuation Response Rate 3 = Adult RR3 * Participation Rate	11.13%	7.20%		
Child Continuation Response Rate 4 = Adult RR4 * Participation Rate	11.97%	7.80%		

7. Statistical Weighting

Survey Weights Overview

A total of 13 population weights (i.e., weights that sum to the appropriate population total) were calculated for the Adult and Child Surveys, including:

- 1 Adult population weight
- 7 Adult subsample population weights (one for each of the 7 subsamples)
- 1 Adult household weight
- 2 Adult subsample household weights (for subsamples 5 and 8)
- 1 Child population weight
- 1 Child household weight

Population weights were developed by calculating a design weight, a compositing factor to account for the overlapping dual frame design, and then raking to population control totals. Household weights were developed by converting the population weight to an initial household weight, then raking to household-level control totals. A detailed description of the process used for each weight is provided in the following sections.

Raking Overview

A survey sample may cover segments of the target population in proportions that do not match the proportions of those segments in the population itself. The differences may arise, for example, from sampling fluctuations, from nonresponse, or because the sample design was not able to cover the entire target population. In such situations one can often improve the relation between the sample and the population by adjusting the sampling weights of the cases in the sample so that the marginal totals of the adjusted weights on specified characteristics, referred to as control variables, agree with the corresponding totals for the population. This operation is known as raking ratio estimation, raking, or sample-balancing, and the population totals are usually referred to as control totals.

Raking is most often used to reduce biases from nonresponse and noncoverage in sample surveys. It adjusts a set of data so that its marginal totals match control totals on a specified set of variables. The term "raking" suggests an analogy with the process of smoothing the soil in a garden plot by alternately working it back and forth with a rake in two perpendicular directions. Raking usually proceeds with one variable at a time, applying a proportional adjustment to the weights of the cases that belong to the same category of the control variable. The initial design weights in the raking process are often equal to the inverse of the selection probabilities and may have undergone some adjustments for unit nonresponse and non-coverage. The weights from the raking process are used in estimation and analysis.

The adjustment to control totals is sometimes achieved by creating a cross-classification of the categorical control variables (e.g., age categories × gender × race × household-income categories) and then matching the total of the weights in each cell to the control total. This approach, however, can spread the sample thinly over a large number of adjustment cells. It also requires control totals for all cells of the cross-classification. Often this is not feasible (e.g., control totals may be available for age × gender × race but not when those cells are subdivided by household income).

The use of raking with marginal control totals for single variables (i.e., each margin involves only one control variable) often avoids many of these difficulties.

In a simple 2-variable example the marginal totals in various categories for the two control variables are known from the entire population, but the joint distribution of the two variables is known only from a sample. In the cross-classification of the sample, arranged in rows and columns, one might begin with the rows, taking each row in turn and multiplying each entry in the row by the ratio of the population total to the weighted sample total for that category, so that the row totals of the adjusted data agree with the population totals for that variable. The weighted column totals of the adjusted data, however, may not yet agree with the population totals for the column variable. Thus, the next step, taking each column in turn, multiplies each entry in the column by the ratio of the population total to the current total for that category. The weighted column totals of the adjusted data now agree with the population totals for that variable, but the new weighted row totals may no longer match the corresponding population totals.

This process continues, alternating between the rows and the columns, and close agreement on both rows and columns is usually achieved after a small number of iterations. The result is a tabulation for the population that reflects the relation of the two control variables in the sample. Raking can also adjust a set of data to control totals on three or more variables. In such situations, the control totals often involve single variables, but they may involve two or more variables.

Ideally, one should rake on variables that exhibit an association with the key survey outcome variables and that are related to nonresponse and/or noncoverage. This strategy will reduce bias in the key outcome variables. In practice, other considerations may enter. A variable such as gender may, not be strongly related to key outcome variables or to nonresponse but raking on it may be desirable to preserve the "face validity" of the sample[12]. The raking of the final weights was conducted using an updated version of the IGCV SAS raking macro developed by Izrael et al[13]. This macro also conducts trimming as part of the raking procedure.

Creation of Weighting Variables

Raking population control totals are not subject to missing data, however the corresponding survey variables may have missing values due to item nonresponse. The SAS weighted sequential hot deck procedure was used to impute missing values for weighting variables before continuing the weight calculations. LAC DPH did imputation for adult age group. This section describes the computation of the variables used in the weighting, including whether any imputation of missing values was necessary.

[12] For more details on raking survey data, see Battaglia M, Izrael D, Hoaglin D, Frankel M. 2009. Practical Considerations in Raking Survey Data. *Survey Practice*. April 2009.

[13] Izrael D, Battaglia M, and Frankel M. SAS Raking Macro, 2009. Available at: https://www.abtassociates.com/sites/default/files/files/Insights/Tools/rake_and_trim_G4_V5.sas

Age
LAC DPH provided a 7-category age group variable in the Adult dataset (*AGEGROUP*) and a 3-category age group variable in the Child dataset (*CAGEGROUP*).

Race
LAC DPH provided recoded race variables for adult and child respondents. These variables are called *RACENEW* in the Adult dataset and *CRACENEW* in the Child dataset. Cases with missing data were imputed by Abt Associates using the weighted sequential hot deck method in order to align with the population benchmarks.

Education
LAC DPH provided a 4-category variable (*EDU*) measuring education level. Missing values were imputed by Abt Associates using the weighted sequential hot deck method.

Marital Status
Missing values in the survey variable *MARRIAGE* were imputed using the weighted sequential hot deck method and collapsed into 4 categories:

1 = Married
2 = Never married, living together, domestic partners
3 = Widowed
4 = Divorced, separated

Nativity
Missing values in the adult variable *BPLUSNON* and the child variable *CBPLUSNON* were imputed by Abt Associates using the weighted sequential hot deck method.

Citizenship status
Missing values in the adult variable *BPLCITIZEN* were imputed by Abt Associates using the weighted sequential hot deck method.

Household Tenure
Missing values in the adult variable *HH79OWN* were imputed by Abt Associates using the weighted sequential hot deck method and collapsed into 2 categories:

1 = Rent/Other arrangement/Homeless
2 = Own

Number of working cell phones in household
Missing values in the variable measuring number of working cell phones owned by adults in the household variable (*Q71B* in Adult data and *C78b* in Child data) were imputed by Abt Associates in both the adult and child data using the weighted sequential hot deck method.

Household Members
Cleaned variables with the number of adults (*HOUADULT* and *CHOUADULT*) and children (*HOUDEPT* and *CHOUDEPT*) in the household were added to both the Adult and Child datasets, respectively. Cases with missing data were imputed by Abt Associates using information in the

variables *TOTADLTS* and *TOTCHILD*. For weighting purposes, the number of adults in the household was capped at 4 in the adult weighting and capped at 5 in the child weighting. The number of children in the household was capped at 3 in the Adult weights and 5 in the Child weights. The variable measuring the number of children in the household used in the Child base sampling weights was capped at 4.

Health District & SPA

LAC DPH provided variables identifying the respondent's Health District (*GEO_HD* for Adult and *PGEO_HD* for Child) and SPA (*GEO_SPA* for Adult and *PGEO_SPA* for Child). These variables did not contain any missing data.

Telephone Service

A 4-category household telephone service variable (*PHONESUM*) was created by LAC DPH for the Adult data and Child data. Missing values were imputed by Abt Associates using the weighted sequential hot deck method within each sample frame.

Adult Survey Weights

The weighting procedures for the 2018 LACHS closely followed the weighting procedures used for the 2011 and 2015 LACHS surveys. The weighting methodology for the combined adult survey weights involved two main steps:

1) calculation of the composite weight, and
2) calculation of final weight based on raking to population control totals.

The development of the composite weight involved calculating a base sampling weight equal to the reciprocal of the selection probability of the sample telephone number (i.e., total telephone numbers in the sampling frame divided by telephone numbers released). The base sampling weight was adjusted for the random sampling of one adult from each landline telephone number household. The final aspect of the composite weight calculation involved combining dual user (landline and cell phone service) adults from the landline and cell phone samples.

The raking step aligned the demographics of adult respondents to population benchmarks on the following dimensions:

County level controls:

- marital status
- education
- number of adults in the household
- number of children in the household
- race/ethnicity
- age by gender
- nativity
- citizenship status
- household tenure status
- Health District
- telephone service

Controls within each SPA:

- race/ethnicity
- gender by age

The final raked weight for use in estimation is *ADULT_POP_WT*. The final weight for the 6,966 completed adult interviews sums to 7,995,270 adults residing in households in LA County. This population total comes from the July 1, 2017 Population Estimates (PEPs)[14]. The *ADULT_SAMP_WT* was scaled to the sample size of 6,966 interviews.

Composite Weight

Base Sampling Weights

The base sampling weight for each stratum equals the population count of telephone numbers in the stratum divided by the sample size of phone numbers released for interviewer dialing for that stratum. The base sampling weights (BSW) for each stratum are shown in Table 2.

Table 2. Adult Survey Base Sampling Weights

FPROJ	NOSTRATA	Stratum	Total Sample Size of Telephone Numbers	Population Count of Telephone Numbers	BSW
24198al	1	Landline Cross-Section	169,907	8,491,000	49.9744
24198am	2, 24	Cell Phone Cross-Section	142,308	16,365,100	114.9978
24198al	3	Adult LL SPA 1 Oversample	36,867	185,100	5.02075
24198al	5	Adult LL SPA 5 Oversample	53,455	776,700	14.52998
24198al	20	Adult LL SPA 4 Oversample	27,092	375,500	13.86018
24198al	21	Adult LL SPA 7 Oversample	38,377	1,694,200	44.14623

An adjustment was also made to account for the fact that one adult was randomly sampled from each landline sample household. For the landline sample households (*QVERS* = 1): *BSW_NUM_ADULT* = *BSW* times the number of adults in the household (with the maximum number of adults in the household capped at 4). The cell phone was treated as a personal communication device and therefore no random selection of an adult from the household took place. For the cell phone sample (*QVERS* = 2): *BSW_NUM_ADULT* = *BSW*.

Compositing Factors

[14] Mid-year (July 1) Population Estimates, Population Estimation and Projection System (PEPS) data 2017, Los Angeles County Internal Services Department (LACISD), released 2018/05/07.

The cell phone and landline samples cannot be simply combined because there is an overlap component that would be over-represented (dual users from the cell phone sample and dual users from the landline sample). Compositing factors allow the overlap components to be combined. Furthermore, we separated the dual users from each sample into cell mostly and not cell mostly groups. We calculated separate compositing factors (λ) for the cell mostly and not cell mostly groups. For each group the two compositing factors sum to 1.0 (i.e., $\lambda + (1- \lambda) = 1.0$).

Four dual user groups were created from a combination of the sample frame (*FPROJ*) and the household's response in the imputed household phone service variable (*I_PHONESUM2)*:

Category 3: Landline Sample Cell mostly, dual user (*FPROJ*=24198al and *I_PHONESUM2*=3)
Category 4: Landline Sample Not Cell mostly, dual user (*FPROJ*=24198al and *I_PHONESUM2*=4)
Category 5: Cell Sample Cell mostly, dual user (*FPROJ*=24198am and *I_PHONESUM2*=3)
Category 6: Cell Sample Not Cell mostly, dual user (*FPROJ*=24198am and *I_PHONESUM2*=4)

For each of the four dual user categories, we calculated the coefficient of variation (CV) of *BSW_NUM_ADULT*. The CV was then used to calculate the design effect due to unequal weighting:

$$Deff = 1 + CV^2.$$

The effective sample size for each of the above four categories was calculated by dividing the unweighted count of interviews in a category by the design effect for that category. Table 3 shows the number of interviews and compositing factor for each dual user category.

For the cell mostly overlap sample:

Category 3 Compositing Factor = Category 3 Effective Sample Size / Sum of Category 3 and 5 Effective sample Sizes.

Category 5 Compositing Factor = Category 5 Effective Sample Size / Sum of Category 3 and 5 Effective sample Sizes.

For the not cell mostly overlap sample:

Category 4 Compositing Factor = Category 4 Effective Sample Size / Sum of Category 4 and 6 Effective sample Sizes.

Category 6 Compositing Factor = Category 6 Effective Sample Size / Sum of Category 4 and 6 Effective sample Sizes.

Table 3. Compositing Factor for each Dual User Category in Adult Sample

Dual User Category	Number of Interviews	Compositing Factor
3 (Cell mostly, dual user, landline sample)	810	0.495
4 (Not cell mostly, dual user, landline sample)	1,793	0.724
5 (Cell mostly, dual user, cell sample)	540	0.505
6 (Not cell mostly, dual user, cell sample)	444	0.276

For dual users in either sample frame (*I_PHONESUM2* = 3 or 4):

COMPOSITE_WT = *BSW_NUM_ADULT* x COMPOSITING FACTOR

For landline only and cell phone only respondents (*I_PHONESUM2* = 1 or 2):

COMPOSITE_*WT* = *BSW_NUM_ADULT*

Raking to Population Control Totals

The *COMPOSITE_WT* of each responding adult was then raked to population control totals for 13 margins:

1) Telephone service (*I_PHONESUM2*),
2) Health District (*GEO_HD*),
3) SPA by Race/ethnicity (*GEO_SPA_I_RACE*),
4) SPA by gender by age (*GEO_SPA_GENDER_AGEGROUP*),
5) Number of adults in the household (*I_HOUADULT*),
6) Number of children in the household (*I_HOUDEPT2),*
7) Citizenship status (*I_CITIZEN*),
8) Nativity (*I_NAT*),
9) Household tenure status (*I_TEN*2),
10) Marital status (*I_MARR4*),
11) Education (*I_EDU*),
12) Race/ethnicity (*I_RACE*), and
13) Gender by age (*GENDER_AGEGROUP*).

It was necessary to do some collapsing of small sample size categories to help avoid extreme weights. Appendix III-A shows the categories that were collapsed.

The population control totals for education, marital status, number of adults in the household, number of children in the household, household tenure status, nativity, and citizenship status were obtained from the 2013-2017 American Community Survey PUMS. These control totals are for adults 18 years of age and older living in households in LA County. The population control totals

for Health District, race/ethnicity, gender by age, SPA by race/ethnicity, and SPA by gender by age were provided by LAC DPH and obtained from the July 1, 2017, Population Estimates (PEPs).

Since the most recent phone service estimates for LA County were released by the National Center for Health Statistics (NCHS) in 2012, estimates of household telephone service for LA County were constructed from the model-based estimates for the state of California released in 2019[15]. These NCHS estimates are for January – December 2017. Since the cell phone only population increases each year, we used NCHS estimates[16] for 2017 and 2018 in the West Census Region to increase the percent of households that were cell phone only (i.e., a 2.4 percent point increase), and reduced the other three telephone service groups so that the percentages summed to 100%. Table 4 shows the population benchmark for household telephone service in the Adult weights.

Table 4. 2018 Telephone Service Benchmark for Adult Survey

2018 Telephone Service for Adults	
Cell-only	56.93%
Landline-Only	4.19%
Dual user, cell mostly	18.13%
Dual user, not cell mostly	20.76%
	100%

The IGCV raking macro used weight trimming during the raking iteration to help avoid extreme weights. The raking used the four trimming parameters shown below. The population control totals and weighted sample distributions prior to and after raking are shown in Appendix III-B. The raking macro was set to a maximum of 50 iterations and a convergence criterion of a maximum difference of 0.05 percentage points between a control total percent and the corresponding weighted sample percent.

IGCV weight trimming values:	
A = 5.0	/* weight will be decreased to individual weight times A */
B = 0.20	/* weight will be increased to individual weight times B */
C = 10.0	/* weight will be decreased to mean weight times C */
D = 0.10	/* weight will be increased to mean weight times D */

[15] Ganesh N. Wireless substitution: State-level estimates from the National Health Interview Survey, 2017. National Health Statistics Reports. Hyattsville, MD: National Center for Health Statistics. March 2018. Available from: https://www.cdc.gov/nchs/data/nhis/earlyrelease/Wireless_state_201903.pdf

[16] Blumberg SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, January–June 2018. National Center for Health Statistics. December 2018. Available from: https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201812.pdf

The final raked weight for use in estimation is *ADULT_POP_WT*. The final weight for the 6,966 completed adult interviews sums to 7,995,270 adults residing in households in LA County. This population total comes from the July 1, 2017, Population Estimates (PEPs). The *ADULT_SAMP_WT* was scaled to the sample size of 6,966 interviews.

Adult Population Subsamples

The LACHS administered questionnaire modules to 7 random subsamples of the adult sample. Each adult in a subsample already has a *COMPOSITE_WT* calculated from the adult sample weighting. This weight was used as the raking input weight for each subsample. The number of interviews conducted in each subsample and the corresponding weights are shown in Table 5.

Table 5. Summary of Adult Population Subsample Weights

Subsample (*SBSA*)	Number of Interviews	Population Weight	Sample Weight
1	996	***ADULT_POP_WT_SBSMP_1***	***ADULT_SAMP_WT_SBSMP_1***
2	980	***ADULT_POP_WT_SBSMP_2***	***ADULT_SAMP_WT_SBSMP_2***
3	1021	***ADULT_POP_WT_SBSMP_3***	***ADULT_SAMP_WT_SBSMP_3***
5	966	***ADULT_POP_WT_SBSMP_5***	***ADULT_SAMP_WT_SBSMP_5***
6	994	***ADULT_POP_WT_SBSMP_6***	***ADULT_SAMP_WT_SBSMP_6***
7	983	***ADULT_POP_WT_SBSMP_7***	***ADULT_SAMP_WT_SBSMP_7***
8	1026	***ADULT_POP_WT_SBSMP_8***	***ADULT_SAMP_WT_SBSMP_8***

A key aspect of the raking of each subsample was a determination of the collapsing of small sample size categories. We implemented the cell collapsing by first examining the sample sizes by subsample for each raking variable (see Appendix III-D). We felt that using one set of cell collapsing rules for all subsamples would allow for the consistent weighting of each subsample. Appendix III-F shows the collapsed categories used in all subsamples.

The IGCV raking macro used weight trimming during the raking iteration to help avoid extreme weights. The raking used the four trimming parameters shown below. The raking macro was set to a maximum of 50 iterations and a convergence criterion of a maximum difference of 0.5 percentage points between a control total percent and the corresponding weighted sample percent. The population control totals and weighted distributions prior to and after raking for the first subsample are shown in Appendix III-F. The raking results for the other subsamples are very similar to the first subsample raking and are therefore not included in the appendix.

IGCV weight trimming values:	
A = 5.0	/* weight will be decreased to individual weight times A */
B = 0.20	/* weight will be increased to individual weight times B */
C = 10.0	/* weight will be decreased to mean weight times C */
D = 0.10	/* weight will be increased to mean weight times D */

Child Survey Weights

The weighting procedures for the 2018 Child Survey closely followed the weighting procedures used for the 2011 and 2015 LACHS surveys. The weighting methodology for the Child sample involved two main steps:

1) calculation of the composite weight, and
2) calculation of final weight based on raking to population control totals.

The development of the composite weight involved calculating a base sampling weight equal to the reciprocal of the selection probability of the sample telephone number (i.e., total telephone numbers in the sampling frame divided by telephone numbers released). The base sampling weight was adjusted for the number of adult cell phone telephone numbers associated with the household, and for the random sampling of a child from each household. The final aspect of the composite weight calculation involved combining dual user (landline and cell phone service) households from the landline and cell phone samples.

The raking step aligned the demographics of child respondents to population benchmarks on the following dimensions:

County level controls:

- number of adults in the household
- number of children in the household
- race/ethnicity of the child
- age by gender of the child
- nativity of the child
- Health District
- telephone service

Controls within each SPA:

- race/ethnicity of the child
- gender by age of the child

Composite Weight

Base Sampling Weights

The first base weight adjustment (*CHILD_BSW_PRELIM*) accounts for the probability of selecting the child within each sample frame and stratum. This adjustment is computed as the population

count of telephone numbers in a stratum divided by the sample size of cell phone numbers in that stratum released for interviewer dialing.

The Child interviews originated from completed Adult Survey interviews (landline or cell phone RDD samples) or from the supplemental samples (landline or cell phone RDD). Since cell phone samples were drawn from two possible sample sources (*FPROJ* = 24198am and 24198cm), the base sampling weights for cell sample respondents (*CHILD_BSW_PRELIM*) were divided by two to form the final base sampling weight (*CHILD_BSW*). Since landline samples were drawn from two possible sample sources (FPROJ = 24198al and 24198cl), the base sampling weights for landline sample respondents (*CHILD_BSW_PRELIM*) were divided by two to form the final base sampling weight (*CHILD_BSW*). Table 6 shows the population counts, sample sizes, and base sampling weight values for each sample frame and stratum.

Table 6. Child Survey Base Sampling Weights

Sample Frame (FPROJ)	NOSTRATA	Stratum	Total Sample Size of Telephone Numbers	Population Count of Telephone Numbers	CHILD_BSW_PRELIM	CHILD_BSW
24198al	1	Adult Landline Cross-Section	169,907	8,491,000	49.9744	24.9872
24198am	2, 24	Adult Cell Phone Cross-Section	142,308	16,365,100	114.9978	57.4989
24198al	3	Adult LL SPA 1 Oversample	36,867	185,100	5.0208	2.5104
24198al	5	Adult LL SPA 5 Oversample	53,455	776,700	14.5300	7.2650
24198al	20	Adult LL SPA 4 Oversample	27,092	375,500	13.8602	6.9301
24198al	21	Adult LL SPA 7 Oversample	38,377	1,694,200	44.1462	22.0731
24198cl	17	Child Landline Cross-Section	238,328	8,491,000	35.6274	17.8137
24198cm	18	Child Cell Phone Cross-Section	194,601	16,365,100	84.0957	42.0478
24198cl	8	Child LL SPA 1 Oversample	89,383	185,100	2.0709	1.0354
24198cl	10	Child LL SPA 5 Oversample	162,552	776,700	4.7782	2.3891
24198cl	9	Child LL SPA 4 Oversample	150,403	375,500	2.4966	1.2483
24198cl	13	Child LL SPA 7 Oversample	32,228	1,694,200	52.5692	26.2846

The child sample involved determining whether the household contained one or more working cell phones. This means that a child living in a cell phone household containing three adult working cell phones had a higher probability of selection than a child living in a cell phone household with

one adult working cell phone. To adjust for the unequal probabilities of selection we divided the final base sampling weight by the number of adult cell phones in the household (*I_C78B2)*:

If *I_C78B2*> 0, *CHILD_NUM_CELL = CHILD_BSW* / *I_C78B2*.
Else, *CHILD_NUM_CELL = CHILD_BSW*.

One child was randomly sampled from each sample household. This adjustment (*CHILD_NUM _WT)* was made by multiplying the value in *CHILD_NUM_CELL* by the number of children in the household in the imputed variable *I_CHOUDEPT4*, where values greater than 4 were recoded to 4.

CHILD_NUM _WT = CHILD_NUM_CELL x I_CHOUDEPT4.

Compositing Factors

The cell phone and landline samples cannot be simply combined because there is an overlap component that would be over-represented (dual users from the cell phone sample and dual users from the landline sample). Compositing factors allow the overlap components to be combined. Furthermore, we separated the dual users from each sample into cell mostly and not cell mostly groups. We calculated separate compositing factors (λ) for the cell mostly and not cell mostly groups. For each group the two compositing factors sum to 1.0 (i.e., $\lambda + (1- \lambda) = 1.0$).

Four dual user groups were created from a combination of the sample frame (*FPROJ*) and the household's response in the imputed household phone service variable (*I_CPHONESUM2)*:

Category 3: Landline Sample Cell mostly, dual user (*FPROJ*=24198al,24918cl and *I_CPHONESUM2*=3)
Category 4: Landline Sample Not Cell mostly, dual user (*FPROJ*=24198al,24198cl and *I_CPHONESUM2*=4)
Category 5: Cell Sample Cell mostly, dual user (*FPROJ*=24198am, 24198cm and *I_CPHONESUM2*=3)
Category 6: Cell Sample Not Cell mostly, dual user (*FPROJ*=24198am, 24198cm and *I_CPHONESUM2*=4)

For each of the four dual user categories we calculated the coefficient of variation (CV) of *CHILD_NUM_WT*. The CV was then used to calculate the design effect due to unequal weighting:

$Deff = 1 + CV^2$.

The effective sample size for each of the above four categories was calculated by dividing the unweighted count of interviews in a category by the design effect for that category. Table 7 shows the number of interviews and compositing factor for each dual user category.

For the cell mostly overlap sample:

Category 3 Compositing Factor = Category 3 Effective Sample Size / Sum of Category 3 and 5 Effective sample Sizes.

Category 5 Compositing Factor = Category 5 Effective Sample Size / Sum of Category 3 and 5 Effective sample Sizes.

For the not cell mostly overlap sample:

Category 4 Compositing Factor = Category 4 Effective Sample Size / Sum of Category 4 and 6 Effective sample Sizes.

Category 6 Compositing Factor = Category 6 Effective Sample Size / Sum of Category 4 and 6 Effective sample Sizes.

Table 7. Compositing Factor for each Dual User Category in Child Sample

Dual User Categories	Number of Interviews	Compositing Factor
3 (Cell mostly, dual user, landline sample)	1,005	0.604
4 (Not cell mostly, dual user, landline sample)	1,077	0.782
5 (Cell mostly, dual user, cell sample)	406	0.396
6 (Not cell mostly, dual user, cell sample)	192	0.218

For dual users in either sample frame (*I_CPHONESUM* 2= 3 or 4):

CHILD_COMPOSITE_WT = *CHILD_NUM_WT* x Compositing Factor.

For landline only and cell phone only respondents (*I_CPHONESUM2* = 1 or 2):

CHILD_COMPOSITE_WT = *CHILD_NUM_WT*.

Raking to Population Control Totals

The *CHILD_COMPOSITE_WT* of each responding child was raked to population control totals for 9 margins:

1) Telephone service (*I_CPHONESUM2*),
2) SPA by Race/ethnicity of the child (GEO_*SPA_ I_CRACE*),
3) SPA by gender and agegroup of the child (GEO_*SPA_GENDER_CAGEGROUP*),
4) Health District (PGEO_*HD*),
5) Number of children in the household (I_*CHOUDEPT2*),
6) Number of adults in the household (I_*CHOUADULT2*),
7) Nativity of the child (*I_CNAT2*),
8) Race/ethnicity of the child (*I_CRACE2*), and
9) Gender by age of the child (*GENDER_CAGEGROUP*).

It was necessary to do a limited amount of collapsing of small sample size categories for the other raking variables to help avoid extreme weights. Appendix III-G shows each raking variable and the categories that were collapsed.

The population control totals for number of adults in the household, number of children in the household, and nativity were obtained from the 2013-2017 American Community Survey PUMS. These control totals are for children under the age of 18 years living in households in LA County. The population control totals for Health District, race/ethnicity, gender by age, SPA by race/ethnicity, and SPA by gender by age were obtained from July 1, 2017 PEPs for children in LA County.

Since the most recent phone service estimates for LA County were released by the National Center for Health Statistics (NCHS) in 2012, estimates of household telephone service for LA County were constructed from the model-based estimates for the state of California released in 2019[17]. These NCHS estimates are for January – December 2017 and include children living in households with a telephone. Since the cell phone only population increases each year, we used NCHS estimates[18] for 2017 and 2018 in the West Census Region to increase the percent of households that were cell phone only (i.e., a 2.4 percentage point increase), and reduced the other three telephone service groups so that the percentages summed to 100%. Table 8 shows the population benchmark for household telephone service used in the Child weights.

Table 8. 2018 Telephone Service Benchmark for Child Survey

2018 Telephone Service for Adults	
Cell-only	64.30%
Landline-Only	2.64%
Dual user, cell mostly	20.44%
Dual user, not cell mostly	12.61%
	100%

The IGCV raking macro used weight trimming during the raking iteration to help avoid extreme weights. The raking used the four trimming parameters shown below. The population control totals and weighted sample distributions prior to and after raking are shown in Appendix III-H. The raking macro was set to a maximum of 50 iterations and a convergence criterion of a maximum difference of 0.05 percentage points between a control total percent and the corresponding weighted sample percent.

[17] Ganesh N. Wireless substitution: State-level estimates from the National Health Interview Survey, 2017. National Health Statistics Reports. Hyattsville, MD: National Center for Health Statistics. March 2018. Available from: https://www.cdc.gov/nchs/data/nhis/earlyrelease/Wireless_state_201903.pdf

[18] Blumberg SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, January–June 2018. National Center for Health Statistics. December 2018. Available from: https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201812.pdf

IGCV weight trimming values:	
A = 6.0	/* weight will be decreased to individual weight times A */
B = 0.167	/* weight will be increased to individual weight times B */
C = 11.0	/* weight will be decreased to mean weight times C */
D = 0.091	/* weight will be increased to mean weight times D */

The final raked weight for use in estimation is *CHILD_POP_WT*. The final weight for the 4,986 completed child interviews sums to 2,277,378 children in LA County. This population total comes from the July 1, 2017, Population Estimates (PEPs). The *CHILD_SAMP_WT* was scaled to the sample size of 4,986 child interviews.

Adult Household Weights

The weighting procedures for the 2018 LACHS closely followed the weighting procedures used for the 2011 and 2015 LACHS surveys. The weighting methodology for the combined adult sample involved two main steps:

1) Conversion of the final adult population weight to an initial household weight, and
2) Calculation of final household weight based on raking to household control totals for LA County.

The development of the initial household weight involved dividing the final adult population weight by the number of adults in the household at the point of respondent selection. Because cell phone-only and dual user (landline and cell phone service) households with multiple adult cell phones had a greater chance of being sampled than a cell-only or dual user household with one adult cell phone, we divided the initial household weight for those households by the number of adult cell phones in the household. Details of the calculation of the adult population weights are outlined in the Adult Weights section.

The raking step aligned the demographics of households to household-level benchmarks on the following dimensions:

- number of adults in the household
- number of children in the household
- household tenure status
- Health District
- SPA
- telephone service

The final raked weight for use in estimation is *ADULT_HH_POP_WT*. The final weight for the 6,966 completed interviews sums to 3,295,198 households in LA County. This household total comes from the July 1, 2017 Population Estimates (PEPs). The *ADULT_HH_SAMP_WT* was scaled to the sample size of 6,966 interviews.

Initial Household Weight

The calculation of the final adult population weight (*ADULT_POP_WT*) involved extensive poststratification to population control totals to adjust for differential nonresponse:

County level controls:

- marital status
- education
- number of adults in the household
- number of children in the household
- race/ethnicity
- age by gender
- nativity
- citizenship status
- household tenure status
- Health District
- telephone service

Controls within each SPA:

- race/ethnicity
- gender by age

The adult questionnaire contains a limited set of household level variables that can be used in poststratification. To maintain the adult sample adjustment for differential nonresponse in the final household weights we divided *ADULT_POP_WT* of the landline sample adults by the number of adults in the household at the point of adult respondent selection (*S3* with the maximum number of adults in the household capped at 4). Dividing the adult population weight by the number of adults in the household yields an initial household weight (*HH_WT_1*) because we are removing the within-household stage in the sample design. This step was not necessary for the cell phone sample because the cell phone was treated as a personal communication device.

A cell phone-only household containing two or more adult working cell phones had a higher probability of selection than a cell phone-only household with one adult working cell phone. Furthermore, for dual user households (landline and cell phone service) a household with a landline phone and multiple adult working cell phones had a higher probability of selection than a dual user household with a landline phone and one adult working cell phone. To adjust for the unequal probabilities of selection we divided *HH_WT_1* by the number of adult cell phones in the household (I_Q71B2).

Raking to Population Control Totals

The initial household weight (*HH_WT_2*) was raked to household-level control totals for six margins:

1) Telephone service (*I_PHONESUM2*),
2) Number of adults in the household (*I_HOUADULT*),
3) Number of children in the household (*I_HOUDEPT2*),

4) Household tenure status (*I_TEN*2),
5) Health District (*GEO_HD*), and
6) SPA (*GEO_SPA*).

The control totals for the number of adults in the household, number of children in the household, and household tenure status were obtained from the 2013-2017 American Community Survey PUMS. These control totals are for households in LA County. The control totals for households by Health District and SPA were obtained from the 2013-2017 American Community Survey Table B11005. No collapsing of raking categories due to small sample size was required.

The National Center for Health Statistics does not publish telephone usage estimates for households in LA County. The telephone usage group household estimates for LA County therefore relied on the estimates used to compute the Adult population weights.

The IGCV raking macro used weight trimming during the raking iteration to help avoid extreme weights. The raking used the four trimming parameters shown below. The household control totals and weighted sample distributions prior to and after raking are shown in Appendix III-C. The raking macro was set to a maximum of 50 iterations and a convergence criterion of a maximum difference of 0.05 percentage points between a control total percent and the corresponding weighted sample percent.

IGCV weight trimming values:	
A = 5.0	/* weight will be decreased to individual weight times A */
B = 0.20	/* weight will be increased to individual weight times B */
C = 10.0	/* weight will be decreased to mean weight times C */
D = 0.10	/* weight will be increased to mean weight times D */

The final raked weight for use in estimation is *ADULT_HH_POP_WT*. The final weight for the 6,966 completed interviews sums to 3,295,198 households in LA County. This household total comes from the July 1, 2017 Population Estimates (PEPs). The *ADULT_HH_SAMP_WT* was scaled to the sample size of 6,966 interviews.

Household Weights for Subsamples

Adult Household Weights were also computed for subsamples 5 and 8. Since each household already had an initial household weight (*HH_WT_2*), this was used as the raking input weight.

The IGCV raking macro used weight trimming during the raking iteration to help avoid extreme weights. The raking macro was set to a maximum of 50 iterations and a convergence criterion of a maximum difference of 0.05 percentage points between a control total percent and the corresponding weighted sample percent. The raking used the four trimming parameters shown below. Household control totals and weighted sample distributions prior to and after raking are shown in Appendix III-J, Appendix III-K, and Appendix III-L.

IGCV weight trimming values:	
A = 5.0	/* weight will be decreased to individual weight times A */
B = 0.20	/* weight will be increased to individual weight times B */
C = 10.0	/* weight will be decreased to mean weight times C */
D = 0.10	/* weight will be increased to mean weight times D */

The adult household weight for subsample 5 is ADULT_HH_POP_WT_SBSMP_5. It sums to 3,295,198 households in LA County. The household sample weight is ADULT_HH_SAMP_WT_SBSMP_5. It sums to 966 interviews.

The household population weight for subsample 8 is ADULT_HH_POP_WT_SBSMP_8. It sums to 3,295,198 households in LA County. The household sample weight is ADULT_HH_SAMP_WT_SBSMP_8. It sums to 1026 interviews.

Child Household Weights

The weighting procedures for the 2018 LACHS closely followed the weighting procedures used for the 2011 and 2015 LACHS surveys. The weighting methodology for the combined landline and cell phone child sample involved two main steps:

1) Conversion of the final child population weight to an initial household weight, and
2) Calculation of final household weight based on raking to household control totals for LA County.

The development of the initial household weight involved dividing the final child population weight by the number of age-eligible children in the household at the point of the random selection of the child from the household. Details of the calculation of the child population weights are outlined in the Child Weights section.

The raking step aligned the demographics of households with children to household-level benchmarks on the following dimensions:

- number of adults in the household
- number of children in the household
- Health District
- SPA
- telephone service

The final raked weight for use in estimation is *CHILD_HH_POP_WT*. The final weight for the 4,986 completed child interviews sums to 1,121,136 households in LA County with at least one child under 18 years of age. This population total comes from the July 1, 2017, Population Estimates (PEPs). The *CHILD_HH_SAMP_WT* was scaled to the sample size of 4,986 child interviews.

Initial Household Weight

The calculation of the final child population weight (*CHILD_POP_WT*) involved extensive poststratification to population control totals to adjust for differential nonresponse and non-coverage:

County level controls for:

- number of adults in the household
- number of children in the household
- race/ethnicity of the child
- gender by age of the child
- nativity of the child
- Health District
- telephone service

Controls within each SPA for:

- race/ethnicity of the child
- gender by age of the child

The child questionnaire contains a limited number of household level variables that can be used in poststratification. To maintain the child sample adjustment for differential nonresponse in the final household weights we divided *CHILD_POP_WT* by the number of age-eligible children in the household at the point of random selection of the child from the household. Dividing a child population weight by the number of age-eligible children in the household at the point of respondent selection yields an initial household weight (*CHILD_HH_WT_1*) because we are removing the within-household stage of the sample design. Cell-only and dual user (landline and cell phone service) households with multiple adult cell phones had a higher probability of selection than cell-only and dual user households with one adult cell phone. However, this adjustment was already incorporated into the child population weight calculations, so it was not necessary to implement it for the household weights.

Raking to Population Control Totals

The initial household weight (*CHILD_HH_WT_1*) was raked to population control totals for five margins:

1) Telephone service (I_CPHONESUM2),
2) Number of children in the household (I_CHOUDEPT2),
3) Number of adults in the household (I_CHOUADULT2),
4) Health District (PGEO_*HD*), and
5) SPA (*PGEO_SPA*).

The control totals for the number of children in the household, and number of adults in the household were obtained from the 2013-2017 American Community Survey PUMS. These control totals are for households with at least one child in LA County. The control totals for households with children by Health District and SPA were obtained from the 2013-2017 American

Community Survey Table B11005. No category collapsing of raking categories due to small sample size was required.

The National Center for Health Statistics does not publish telephone usage estimates for households with children in LA County. The telephone usage group household estimates for LA County therefore relied on the estimates used to compute the Child Population Weights.

The IGCV raking macro used weight trimming during the raking iteration to help avoid extreme weights. The raking used the four trimming parameters shown below. The household control totals and weighted sample distributions prior to and after raking are shown in Appendix III-I. The raking macro was set to a maximum of 50 iterations and a convergence criterion of a maximum difference of 0.05 percentage points between a control total percent and the corresponding weighted sample percent.

IGCV weight trimming values:	
A = 6.0	/* weight will be decreased to individual weight times A */
B = 0.167	/* weight will be increased to individual weight times B */
C = 11.0	/* weight will be decreased to mean weight times C */
D = 0.091	/* weight will be increased to mean weight times D */

The final raked weight for use in estimation is *CHILD_HH_POP_WT*. The final weight for the 4,986 completed child interviews sums to 1,121,136 households in LA County with at least one child under 18 years of age. The *CHILD_HH_SAMP_WT* was scaled to the sample size of 4,986 child interviews.

Design Effect and Margin of Error

Weighting and survey design features that depart from simple random sampling tend to result in an increase in the variance of survey estimates. This increase, known as the design effect, should be incorporated into the margin of error, standard errors, and tests of statistical significance. The overall design effect for a survey is commonly approximated as the 1 plus the squared coefficient of variation of the weights. A summary of the final trimmed weights and their associated design effect and 95% margin of error is reported in Table 9. Estimates based on subgroups will have larger margins of error. It is important to remember that random sampling error is only one possible source of error in a survey estimate. Other sources, such as question wording and reporting inaccuracy, may contribute additional error.

Table 9. Design Effect and Margin of Error for Final Weights

Weight Variable	Number of interviews	Mean	Standard Deviation	Approx DEFF	Effective n	95% MOE
Adult Population weights						
ADULT_POP_WT	6,966	1,147.76	1071.68	1.87	3,722	1.61%
ADULT_SAMP_WT	6,966	1.00	0.93	1.87	3,721	1.61%
Adult Population Subsample Weights						
ADULT_POP_WT_SBSMP_1	996	8,027.38	8722.34	2.18	457	4.59%
ADULT_SAMP_WT_SBSMP_1	996	1.00	1.09	2.18	457	4.59%
ADULT_POP_WT_SBSMP_2	980	8,158.44	8378.12	2.05	477	4.49%
ADULT_SAMP_WT_SBSMP_2	980	1.00	1.03	2.05	477	4.49%
ADULT_POP_WT_SBSMP_3	1,021	7,830.82	8296.04	2.12	481	4.47%
ADULT_SAMP_WT_SBSMP_3	1,021	1.00	1.06	2.12	481	4.47%
ADULT_POP_WT_SBSMP_5	966	8,276.68	8650.76	2.09	462	4.56%
ADULT_SAMP_WT_SBSMP_5	966	1.00	1.05	2.09	462	4.56%
ADULT_POP_WT_SBSMP_6	994	8,043.53	7737.73	1.93	516	4.31%
ADULT_SAMP_WT_SBSMP_6	994	1.00	0.96	1.93	516	4.31%
ADULT_POP_WT_SBSMP_7	983	8,133.54	8358.46	2.06	478	4.48%
ADULT_SAMP_WT_SBSMP_7	983	1.00	1.03	2.06	478	4.48%
ADULT_POP_WT_SBSMP_8	1,026	7,792.66	7494.54	1.92	533	4.24%
ADULT_SAMP_WT_SBSMP_8	1,026	1.00	0.96	1.92	533	4.24%
Adult Household Weights						
ADULT_HH_POP_WT	6,966	473.04	473.02	2.00	3,483	1.66%
ADULT_HH_SAMP_WT	6,966	1.00	1.00	2.00	3,483	1.66%
Adult Household Subsample Weights						
ADULT_HH_POP_WT_SBSMP_5	966	3,411.18	3278.17	1.92	502	4.37%
ADULT_HH_SAMP_WT_SBSMP_5	966	1.00	0.96	1.92	502	4.37%
ADULT_HH_POP_WT_SBSMP_8	1,026	3,211.69	3286.56	2.05	501	4.38%
ADULT_HH_SAMP_WT_SBSMP_8	1,026	1.00	1.02	2.05	501	4.38%
Child Population Weights						
CHILD_POP_WT	4,986	456.75	495.42	2.18	2,291	2.05%
CHILD_SAMP_WT	4,986	1.00	1.08	2.18	2,291	2.05%
Child Household Weights						
CHILD_HH_POP_WT	4,986	224.86	226.09	2.01	2,479	1.97%
CHILD_HH_SAMP_WT	4,986	1.00	1.01	2.01	2,479	1.97%

Appendices

Appendices available upon request.