Supporting Statement B for:


# California Health Interview Survey

# Cancer Control Module

# (CHIS-CCM) 2009 (NCI)


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**B: COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS**

**B.1. Respondent Universe and Sampling Methods**

*Respondent Universe:* CHIS is a telephone survey of California's civilian, non-institutionalized population residing in households. The survey excludes potential respondents who are over 65 and too frail or ill to do the interview, unable to speak English or one of the four non-English languages in which the survey is offered, or hard of hearing. One adult (age 18 or older) and, whenever possible, one adolescent (age 12-17) for whom the selected adult is the parent/guardian will be selected from participating households to receive the survey. The target sample size is 48,000 adults and 4,000 adolescents. Additionally, 150 adults and 16 adolescents will complete a pilot version of the CHIS 2009 survey prior to fielding. Additional information on the sample design is included in Attachment 8, which shows the 44 geographic strata, the target sample size within stratum, the total number of households per stratum based on California Department of Finance (CDOF) population projections for 2009, and the approximate unadjusted selection probability within each stratum.

*Sample Design and Sampling Methods:* The survey methods are consistent with the OMB Guidance on Agency Survey and Statistical Information Collections (January 20, 2006). CHIS 2009 uses a dual-frame sampling design. The first frame is a geographically stratified RDD sample of telephone numbers in California with a supplemental oversample of various ethnic sub-populations. The second frame consists of households who use a cell phone as their primary telephone. The data from these two sampling frames will be

integrated into a single data file in order to provide a more representative sample of California's non-institutionalized population.

The geographically stratified RDD sample is designed to produce both state-level estimates and county-level estimates for most of California's 58 counties. The sample is allocated to 44 geographic areas (sampling strata), defined as counties or aggregates of smaller counties with a minimum population size of 50,000 persons per stratum. A minimum sample of 500 persons is allocated to each stratum to maximize the effective sample size for county-level estimates and statewide estimates for major racial and ethnic groups. An ethnic oversample will supplement the RDD sample to provide robust estimates for Koreans (n=500), and Vietnamese (n=500).

The second frame of the CHIS sample will collect data on the small, but rapidly growing population segment of cell phone-only users. According to the National Center for Health Statistics, 13.6% of households had cell phones but no landlines during the first half of 2007.[1] The purpose of the CHIS cell phone sample is to improve the coverage of the telephone survey and minimize any bias that could result from limiting the sample to residential households with landlines.[2] A pilot study was conducted as an adjunct to CHIS 2005 to determine the feasibility of conducting CHIS with a sample of households with cellular telephone service only (no landline service), and a cell phone sample of 835

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[1] Blumberg, Stephen J., Julian V. Luke. 2007. "Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, January – June 2007." Division of Health Interview Statistics, National Center for Health Statistics.
http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200712.pdf
[2] Tucker, Clyde, J. Michael Brick, Brian Meekins. 2007. Household Telephone Service and Usage Patterns in the United States in 2004: Implications for Telephone Samples.  Public Opinion Quarterly. 71(1), 3-22.

households was conducted during CHIS 2007. Pilot data from CHIS 2005 and preliminary data from CHIS 2007 show that response rates for cell phone only users were similar to or slightly lower than those with landline phones, and that no practical limitations significantly influenced survey administration.  In 2009, it is proposed that the cell phone sample be expanded to include households who use a cell phone as their principal telephone.

*Respondent Selection:* CHIS is a multi-stage interview -- first households are sampled and then respondents are selected from within households. At the screener stage, an adult informant (age 18 or older) residing in a household is contacted and asked how many adults reside in the household. If there is only one adult in the household, that adult is selected as the adult respondent. If there are two adults living in the household, the Computer Assisted Telephone Interview (CATI) software randomly selects one adult to be the CHIS respondent. If there are three or more adults, the screener informant will be asked which adult had the most recent birthday, and that adult will be the selected respondent. If the selected respondent is an older adult (65 years and older) who is too frail or ill to participate, the informant will be asked to identify a proxy for the selected older adult.

During the adult interview, adolescents age 12-17 residing in the household will be enumerated. Only if the selected adult respondent is the parent or guardian of one or more adolescents in the household will an adolescent be randomly selected. Following the completion of the adult interview, the interview will ask for the adult for consent to contact the selected adolescent.  The

interviewer will then attempt to contact the adolescent and ask him/her for assent to participate in the survey.

For the cell phone sample, the adult informant will first be asked whether he/she is speaking on a cell phone that is used solely for business purposes; if the respondent answers "yes" to this question, he/she is ineligible for participation in the cell phone component. If there is only one adult in the household or there are multiple adults and each adult has a cell phone, then the adult answering the dialed number will be selected. If some members of the household share a common cell phone then the CHIS sampling methods described above will be implemented to ensure that every adult in the household has an equal chance of selection. This randomization and selection approach yields a sample that is approximately representative of the adult and adolescent populations in each stratum in terms of characteristics such as age, gender, and race and ethnicity.

*Reporting Race/Ethnicity Data:* In all previous cycles of CHIS, OMB approved the method used to collect and report race/ethnicity data. First, CHIS collects race/ethnicity information in the question format mandated by OMB in the 1997 Revisions (OMB Bulletin No. 00-02, March 9, 2000). Respondents that report more than one racial group, or a racial group and Hispanic ethnicity, are subsequently asked if the respondent identifies "most" with a particular race/ethnicity. Consistent with previous cycles, the CHIS 2009 data set will include a race variable that is based on OMB standards for race/ethnicity and supplemental information about which race/ethnicity the multi-racial respondents

most identify with, if any. Lastly, the data set will include a race/ethnicity variable

created based on California Department of Finance standards. Because CHIS

2009 is co-funded by state, federal, and private funders, these additional

race/ethnicity questions are needed to meet the requirements of its California

sponsors. They do not conflict with either the collection of race/ethnicity

information or the construction of variables based on the OMB standards.

*Response Rates:* In reporting response rates for CHIS, it must first be

acknowledged that response rates for state-level surveys vary widely and are not

comparable to response rates for national surveys. California as a whole, and the

state's urban areas in particular, are among the most difficult in the nation in

which to conduct telephone interviews.[3] In addition, California response rates

have been decreasing, consistent with the national trend observed in other RDD

surveys.[4,5]

Several dimensions of the survey methods used in CHIS make achieving

high response rates particularly challenging. First, CHIS is an RDD telephone

survey. A telephone survey is the only cost-effective mode for achieving the

CHIS sample objectives of providing local level data and estimates for the state's

major racial and ethnic groups. Similar surveys that are conducted in person,

such as the NHIS, have higher response rates but produce relatively small

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[3] Behavioral Risk Factor Surveillance System, 2005. Summary Data Quality Report. California ranked 43rd out of 52 state reporting units in overall response rates and 48th out of 52 in the Council of American Survey Research Organizations (CASRO) response rates for the 2004 Behavioral Risk Factor Surveillance System.
[4] Curtin, R., S. Presser, and E. Singer. 2005. Changes in Telephone Survey Nonresponse Over the Past Quarter Century. Public Opinion Quarterly. 69(1), 87-98.
[5] Keeter, S., J. Best, M. Dimock, and P. Craighill. 2004. The Pew Research Center Study of Survey, Nonresponse: Implications for Practice. Paper presented at 2004 meetings of the American Association for Public Opinion Research.

samples and are far more costly. Second, as a population-based survey of households, virtually every household contacted by CHIS is eligible to participate in the survey. In other population-based surveys, only a small minority of contacted households is eligible to participate. Because the relative number of eligible households is much smaller (denominator) and the screening much simpler, they are able to obtain higher response rates.

Comparing survey response rates is further complicated by the use of different methods of calculation. Both CASRO and the American Association for Public Opinion Research (AAPOR) have developed standard methods for calculating response rates; however, there is considerable variation in how these formulas are implemented. The central problem is the difficulty in resolving the eligibility of the sampled telephone numbers that are never answered. Differences in disposition codes used by various CATI programs, different methods for allocating responses to eligibility categories, and different cut-off points for coding an interview as complete all contribute to variation in response rates. In addition, some surveys report weighted response rates and others report unweighted rates. Finally, multi-stage surveys differ in how they incorporate the screener and extended interviews into the response rate formula.

In CHIS 2005, the latest CHIS cycle for which response rate analysis has been completed, response rates were comparable to those of other scientific surveys in California. CHIS 2005 response rates were calculated consistent with the standard approach used by the CDC BRFSS. The CHIS 2005 disposition

codes were matched with those reported in the *2005 BRFSS Summary Data Quality Report*. For CHIS 2005, the Screening Response Rate, the proportion of all known households in which the presence or absence of an eligible respondent has been determined and in which an interviewer *actually spoke* to the selected respondent, was 54 percent, compared with 49 percent for the BRFSS in California. The CHIS 2005 Extended Interview Response Rate, the proportion of contacted selected respondents who successfully completed an interview, was 63 percent as compared with 67 percent for the California BRFSS.  The cooperation rate, defined as the proportion of all respondents interviewed of all eligible units in which a respondent was selected and actually contacted (BRFSS: 2007 Behavioral Risk Factor Surveillance System Summary Data Quality Report), was 62 percent, compared with 59 percent for BRFSS. Because BRFSS reports the screener and extended interview response rates as a single unit (rather than multiplying the screener by the extended interview rates to calculate overall response rates), it is not possible to calculate comparable overall rates for CHIS.

A survey's response rate is not the only, or even the best, measure of its quality. One proven way to assess a survey's representativeness is to compare its findings with those of other similar surveys. An experiment conducted by the Pew Research Center in 2003 compared two surveys that used differential levels of interviewing effort on 90 measures. The surveys had response rates of 51 percent and 27 percent respectively.[6] The results found little difference between

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[6] The Pew Research Center for the People and the Press. 2004. Polls Face Growing Resistance, But Still Representative: Survey Experiment Shows. http://people-press.org/reports/display.php3?ReportID=211

the two surveys. Other studies of polls and omnibus surveys support the finding

that low response rates are not necessarily associated with nonresponse

bias.[7,8,9] To assess CHIS validity, CHIS 2003 data were benchmarked to

estimates on key health insurance, health care access, and health status

indicators from the NHIS California sample. The benchmarking study was

undertaken in collaboration with the National Center for Health Statistics

(NCHS). CHIS data are collected through telephone self-reports; however, the

NHIS data are collected in-person and have a higher response rate, providing a

relative "gold standard" to compare with CHIS estimates. Initial analysis of CHIS

and NHIS data found the estimates of demographic and socio-economic

variables were comparable. Although the benchmarking study did find some

differences in specific health indicators, there were no indications of systematic

bias. A similar comparison of CHIS and BRFSS key health estimates showed

consistent results.

In CHIS 2009, a number of proven strategies to maximize the response

rates will be implemented; these efforts are documented in B.3.

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[7] Curtin, Richard, Stanley Presser, and Eleanor Singer. 2000. "The Effects of Response Rate Changes on the Index of Consumer Sentiment." Public Opinion Quarterly 64:413–28
[8] Keeter, Scott, Carolyn Miller, Andrew Kohut, Robert Groves, and Stanley Presser. 2000. "Consequences of Reducing Nonresponse in a Large National Telephone Survey." Public Opinion Quarterly 64:125–48
[9] Merkle, Daniel, and Murray Edelman. 2002. "Nonresponse in Exit Polls: A Comprehensive Analysis." In Survey Nonresponse, ed. R. M. Groves, D. A. Dillman, J. L. Eltinge, and R. J. A. Little, pp. 243–58. New York: Wiley.

**B.2.    Procedures for the Collection of Information**

*Survey Introduction:* CHIS data will be collected via telephone interviews from civilian, residential households in California. The RDD sample frame will be matched against list directories, using reverse directory services, to obtain address information so that an advance letter can be mailed to potential respondent households to explain the purpose of this study (see Attachment 5A). The advance letter will be mailed to all non-cell phone respondents, about 75 percent of the households in the CHIS sample. The CHIS 2009 sample of cell-phone telephone numbers cannot be matched to addresses; therefore, cell phone households will not receive advance letters.

*Survey Administration:* CHIS 2009 interviews will be administered as an RDD survey through a CATI system by interviewers trained by the data collection contractor and CHIS staff. CHIS data will be collected over a 6 - 9 month period to distribute the data collection burden and to minimize any seasonal biases.

CHIS interviewers will receive at least 18 hours of project-specific instruction in addition to the general interviewer skill training and CATI skill training provided to new interviewers. In addition, each interviewer will receive four hours of refusal avoidance training that focuses on providing answers to frequently asked questions, voice quality, and listening skills. Periodically, interviewers will also receive refresher training.

To minimize data entry errors, data consistency checks and range checks will be built into the CATI programming for CHIS. To ensure quality in the interviewing process, interviews will be randomly monitored both in person and

via telephone from a remote station throughout the data collection period. All CHIS telephone calls made by the interviewers will be logged daily in detailed tracking reports, which will routinely be reviewed for irregularities and as a check on progress.

## B.2.1. Statistical Methodology for Stratification and Sample Selection

**RDD Sample:** CHIS uses an RDD telephone number generation technique that uses 100-banks with one or more listed telephone numbers to create a sample of potential residential households within each stratum. This produces a selection probability for a household that is equal to the ratio of the number of households selected into the sample over the total number of households known to exist in a stratum. Additional information on the sample design is included in Attachment 8, which shows the 44 geographic strata, the target sample size within each stratum, the total number of households per stratum (based on California Department of Finance (CDOF) population projections for 2009), and the approximate unadjusted selection probability within each stratum. To create the Korean and Vietnamese oversamples, CHIS employs geographic oversampling in areas of high concentration of these subgroups and also samples from a surname list sample. The interviewer confirms the ethnicity of each respondent whose telephone number comes from the surname list sample prior to enrolling the respondent in the survey.

**Cell Phone Sample:** The cell phone sample will be drawn from a statewide RDD sample of cell phone numbers from 1000-blocks in California that are cellular (NXXTYPE types 04, 55, 60) or PCS (types 65, 68). Additional

technical restrictions in the sampling include restricting the sample to telephone

numbers which can be dialed into and the exclusion of toll-free telephone

numbers.

## B.2.2. Estimation Procedure

CHIS 2009 data will be statistically weighted to account for the differential

probability of selecting persons into the sample, and the weights will be raked to

the various domains of California population totals.  Specific strategy for drawing

and weighting the CHIS 2009 sample will depend on the results of the recently

fielded CHIS 2007, and as such, final specifications are not available at this time.

The methods detailed below, therefore, enumerate the anticipated CHIS 2009

estimation procedure.

The estimation procedure will first weight the data on the probability of

household selection. Adjustments will be made for households without

telephones. Then, the weights of households with more than one voice line will

be adjusted to correct for their greater than normal probability of selection. Next,

the person-level weight will be created by multiplying the adjusted household

weight by the number of adults in a household. A post-stratification estimation

procedure will then be performed to the person-level weight to bring the sum of

weights to the total adult population using CDOF data projections for CHIS 2009

that are based on the 2000 Census data. Seven variables will be used in the

post-stratification procedure to determine the final person weight: age, gender,

race, ethnicity, geographic stratum (i.e. city, county, strata, and state), education,

and home ownership.

The ethnic surname list sample will be combined with the RDD sample and weighted together, using the dual-frame method developed for CHIS 2003 where the base weight accounts for the multiple selection probabilities for samples drawn from both the RDD and the surname list. The selection probability may then be directly calculated for each sampled telephone number in both frames by using the list of numbers eligible for the surname samples to determine for every RDD sampled number whether or not it was eligible to be sampled for the surname sample as well.

The weighting procedure for the cell phone sample will require modeling because there is no reliable data source that provides totals and characteristics of the cell phone population in California.

The cell phone sample selection probabilities and nonresponse adjustments will be performed using the same procedures as used in the landline or regular RDD sample. The steps involved are: basic probability of selection of the telephone number from the frame, adjustment for nonresponse, adjustment for number of cell-phones (if necessary), and adjustment for the probability of selecting an adult from the household (if the cell phone is shared). Subsequently the RDD and the cell samples will be combined, and the standard CHIS raking procedures will be utilized to adjust the California population totals.

CDOF data, proportionally adjusted for individuals residing in group quarters using 2000 Census data, will be used as the official control totals. The CDOF provides population projections by race, age, sex and ethnicity at the county level that have been used in all CHIS work to date (the 2001 CHIS used

data from the 2000 Census originally, but was re-weighted to the CDOF to be

consistent with the other years of CHIS). These are the same data as are used in

the projections that drive other major surveys (e.g., CPS uses national

projections of age, sex, race and ethnicity as control totals) and are the official

population totals for California.

These methods will ensure that the final weighted CHIS data set

represents the California's population with the smallest undercoverage and

nonresponse error possible for the proposed design.

### B.2.3. Degree of Accuracy Needed for the Purpose Described in the Justification

CHIS is used for estimates of disease prevalence, program participation,

health behaviors, insurance status, etc., for individual counties, race/ethnic

groups and other subpopulations of interest (e.g. the elderly) in the California

population. The large sample size allows robust estimates for any subpopulation

with a sample size of 450 or more with a margin of error of less than 5

percent. For gender, race, ethnicity, or age, estimates at the state level can be

obtained with a margin of error of less than 5 percent. At the county/stratum

level, the minimum sample size of 500 will produce estimates with a margin of

error at or below 7 percent, even with split male/female analyses. In short, CHIS

estimates should approximate the California population.

### B.2.4. Unusual Problems Requiring Specialized Sampling Procedures

CHIS 2009 implements specialized sampling techniques for the cell phone

sample frame and the area probability sample frame in Los Angeles County. The

cell phone sampling techniques are discussed more extensively in B.1., and the area probability sample in B.3.

To maximize participation among California's diverse ethnic populations, CHIS 2009 will be administered in five languages: English, Spanish, Chinese, Korean, and Vietnamese. Building on materials previously translated for the CHIS 2001, 2003, 2005, and 2007 questionnaires, new questions are translated and reviewed for cultural adaptation. Specially trained bilingual/bicultural interviewers will conduct non-English interviews.

## B.2.5. Use of Periodic (Less Frequent Than Annual) Data Collection Cycles

CHIS-CCM 2009 is proposed as a one-time data collection.

## B.3.    Methods to Maximize Response Rates and Deal with Non-Response

A number of generally accepted techniques used to maximize response rates in previous cycles will be repeated in CHIS 2009. As an initial strategy, CHIS uses an advance letter to differentiate the survey from telemarketing. The advance letter (Attachment 5A) explains the purpose of the survey, the sponsors, and its importance, as well as assuring potential respondents that their participation in the survey is voluntary and that their confidentiality will be protected. In CHIS 2005, 66 percent of households were mailed an advance letter and these households had a screener response rate almost 12 percentage points higher than the "no-letter" households. Because having an address is

highly related to screener response rates, the data collection contractor is working to further improve its ability to match telephone numbers with addresses.

To increase interviewer's skills in encouraging individuals to participate in the survey, CHIS 2009 training, coaching, and monitoring will be intensified. The CHIS 2009 training will focus on introducing the survey and handling reluctant or difficult to reach respondents.

Other techniques to increase response rates in previous CHIS cycles will also be repeated in CHIS 2009, including: leaving a message on answering machines (only on first encounter) to announce the survey; dialing a non-responding telephone number at least 14 times over a range of time periods (daytimes, evenings, weekends, etc.); and providing a toll-free number for respondents to call back and set an interview appointment time.

Mailing a "refusal conversion" letter to households that do not firmly decline an initial invitation to participate has also been effectively employed in national RDD surveys as a way to convert these households to participate in the survey. In experiments conducted during CHIS 2005, this method helped convert about one-third of reluctant households, which subsequently completed the survey. The method will be implemented again in CHIS 2009. If a mailing address is available, a letter will be mailed to the household asking them to reconsider and restating the importance, legitimacy and purpose of the survey. The potential participant will then be re-contacted to provide an additional opportunity to participate in the study. Specially trained interviewers will make

refusal conversion telephone calls. Sample refusal conversion letters are included in Attachments 5B-D.

CHIS 2005 implemented a pre-paid $2 financial incentive, which increased response rates by three percent. CHIS 2009 will also include pre-paid financial incentives of $2.00 in the advance letter sent to all households with an available address. This result is consistent with other research, which indicates that pre-paid incentives result in more interviews, more appointments, and lower resistance.[10,11]

By implementing these approaches, we expect to achieve an approximate 70 percent Extended Interview Response Rate and a 50 percent Screener Response Rate for CHIS 2009. However, a survey's response rate is not the only, or even the best measure of how well the survey estimates represent the target population.

**CHIS 2007 In-Person Area Probability Pilot Study:** To further evaluate the nature and magnitude of bias due to nonresponse to the telephone survey and undercoverage of households without telephones, an area probability sample using in-person recruiters was fielded as a component of CHIS 2007. The goal of the pilot test was to evaluate whether or not CHIS estimates are significantly biased due to nonresponse and RDD sample frame undercoverage. If substantive nonresponse bias is detected upon analysis of the data collected during CHIS 2007, further methods to quantify and mitigate the impact of such

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[10] Brick, J. M., Hagedorn, M. C., Montaquila, J., Roth, S. B., and C. Chapman. 2003. Monetary Incentives and Mailing Procedures in a Federally Sponsored Telephone Survey. U.S. Department of Education, National Center for Education Statistics.
[11] Cantor, D., Cunningham, P., Triplett, T., and R. Steinbach. 2003. Comparing Incentives at Initial and Refusal Conversion Stages on a Screening Interview for a Random Digit Dial Survey.

bias will be incorporated in CHIS 2009. Strategies to further assess and alleviate potential nonresponse bias to be explored in CHIS 2009 if needed may include an expansion of the Area Probability pilot fielded in CHIS 2007 or a follow-back study comparing survey respondents with nonrespondents.

**B.4.    Tests of Procedures or Methods to be Undertaken**

Most CHIS-CCM 2009 questions are adopted from previous NHIS Cancer Supplements. New questions were cognitively pre-tested. For these reasons, questions used in the CHIS-CCM 2009 are expected to produce reliable data.

The English version of the final draft instrument will be pre-tested with nine persons (the OMB maximum prior to approval). Due to the small number of subjects, the pretest will be conducted as an interviewer administered, telephone interview with a paper and pencil instrument rather than a CATI system. These pre-tests will check the flow, clarity, difficulty level, and cultural bias of the questions.

The instrument will also be submitted to a CATI pilot test before it is fielded. The pilot test will test the adaptation of the instrument to the CATI system. A total of 150 pilot test interviews are currently planned after OMB approval is obtained. After the first round of pilot testing, the final English version will be translated into other languages and subsequently pilot tested in each language in which CHIS is offered.

In addition, a behavioral coding project first undertaken during CHIS 2003 will be implemented again during CHIS 2009 to evaluate the performance of new content on the adult questionnaire. Trained coders will listen to a sample of

approximately 1,440 recorded interviews to identify potential systematic problems in the administration of new survey questions.

**B.5.  Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data**

As described in A.8, a Sample Design and Survey Methods TAC, consisting of statisticians and survey experts, provides expert advice to CHIS on the weighting schemes, imputation methods, and analytical plans. Members of this TAC are listed in Attachment 3E. In addition, at the recommendation of the Sample Design and Survey Methods TAC, a survey mode planning workgroup including national experts may be convened to propose survey design options for measuring survey bias in preparation for CHIS.  The survey data collection subcontractor for CHIS 2009, Westat Inc., was chosen through a competitive bidding process at UCLA. Westat, Inc. has extensive expertise in survey methodology and has conducted numerous major federal surveys. As described in A.2. (Purpose and Uses of Information), CHIS data is widely used by state and federal agencies, county health departments, universities, research organizations, advocacy groups, community organizations, health care providers, doctoral students, and others. Attachment 9 provides lists of organizations that have used CHIS data and peer-reviewed peer publications based on CHIS data, as well as descriptions of the types of research conducted.