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The North Carolina Child Health Assessment and Monitoring Program: Survey Methodology and Data Collection

by

Donna R. Miles, Ph.D.¹

Harry Herrick, M.S.P.H., M.S.W., M.Ed.¹

Carol A. Ford, M.D.²

Overview

This report describes the development and implementation of the North Carolina Child Health Assessment and Monitoring Program (NC CHAMP) annual survey, conducted by the State Center for Health Statistics (SCHS). NC CHAMP has collected health information on children since 2005 and contributes to a seamless health data system for all North Carolina citizens from birth to old age. NC CHAMP provides data on health issues of North Carolina children that can be used to monitor child health status and identify priority areas at the state level as well as assess relationships between parent health and child health.

Eligible children (birth–17 years) for the NC CHAMP survey are drawn each month from the North Carolina Behavioral Risk Factor Surveillance System (NC BRFSS) land-line telephone survey of adults. One child is randomly selected from the household, and the adult most knowledgeable about the health of the selected child is interviewed in a follow-up survey. Questions on the NC CHAMP survey pertain to a wide variety of health-related

topics, including early childhood development, health care access, oral health, mental health, physical health, nutrition, physical activity, family involvement, and parent opinion on topics such as childhood obesity. State estimates of survey items reported by child's sex, age, race, ethnicity, and household income are posted on the SCHS Web site on an annual basis. A public use data file is generated that contains demographic information on the selected child, substantive health and well-being data for the child and his/her family, and sampling weights.

Introduction

The NC CHAMP was developed in the fall of 2004 and has been conducted annually since January 2005. It is the only comprehensive surveillance system in North Carolina used to assess the health characteristics of approximately 2.2 million children in North Carolina between the ages 0 to 17. NC CHAMP provides a core public health surveillance function in North Carolina, as it supplies valid and reliable state-level statistical estimates on the health issues of North Carolina children.

¹ State Center for Health Statistics, Division of Public Health, North Carolina Department of Health and Human Services, Raleigh, NC

² Division of General Pediatrics and Adolescent Medicine, Department of Pediatrics, School of Medicine and Department of Maternal and Child Health, Gillings School of Global Public Health, University of North Carolina, Chapel Hill, NC

The mission of the NC CHAMP is to meet the health surveillance needs of North Carolina for children and adolescents from birth through age 17. To carry out this mission, NC CHAMP has established the following goals: (1) to monitor the status of child health (ages 0–17) and identify child health problems in North Carolina; (2) to measure parents' perspectives on child health issues; (3) to provide accurate and valid data to inform evidence-based decisions, strategies, and policies to improve child health; and (4) to assess relationships between parent health and child health, and inform family-centered approaches to improve child health. Eligible children for the NC CHAMP survey are drawn each month from the NC BRFSS telephone survey of adults, ages 18 and older.

Methods

Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is a state-based system of health surveys that collects data about health risks and practices associated with the leading causes of morbidity, mortality, and disability. Established in 1984 by the Centers for Disease Control and Prevention (CDC), the BRFSS is the largest telephone health survey in the world and currently collects data in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. North Carolina has been participating in the BRFSS since 1990.

The North Carolina BRFSS program operates through the SCHS as part of the Survey Operations Program (SOP), within the Chronic Disease and Injury (CDI) section of the North Carolina Division of Public Health (NC DPH). The BRFSS is a cross-sectional annual telephone survey that assesses health characteristics of non-institutionalized adults age 18 and older and utilizes a random-digit-dial (RDD) computer-assisted-telephone-interviewing (CATI) system. For detailed information about the BRFSS, refer to the Behavioral Risk Factor Surveillance System Operational and User's Guide (available at www.cdc.gov/brfss).

The BRFSS questionnaire is designed by a working group of state coordinators and CDC's Behavioral Surveillance Branch (BSB) staff and consists of three parts: (1) the core component (fixed core, rotating core,

and emerging core); (2) optional modules; and (3) state-added questions. Two of the North Carolina state-added modules include: (1) Random Child Selection; and (2) CHAMP Follow-up (see appendices B and C). A BRFSS core demographic question asks how many children 17 and younger live in the household. If the respondent indicates that one or more children under the age of 17 live in the household, then the respondent is asked the Random Child Selection module. During the Random Child Selection, if more than one child is living in the household then one child is randomly selected through a pre-programmed process in the CATI data entry system used by each interviewer. Respondents are then asked to report the birth month and year as well as the sex of the selected child. The CHAMP Follow-up module directly follows the Random Child Selection module.

During the CHAMP Follow-up module, respondents are asked if they are willing to participate in a call-back survey that asks additional questions about the health of the selected child. The respondents are reassured that all information will be kept confidential. If they agree to participate in the call-back survey, they are asked if they are the person in the household who knows the most about the health and health practices of the selected child. If not, then they are asked to identify the one person in the household that is most knowledgeable about the health of the child. The relationship of the NC BRFSS respondent to the child, as well as the relationship of the adult that is most knowledgeable about the health of the child (if different from the NC BRFSS respondent), is recorded. The first name of the child (or initials or nickname) is recorded only for the purpose of identifying the randomly selected child during the follow-up interview. Respondents are then asked when is the best time to call back and complete the follow-up survey: daytimes, evenings, or weekends. At the close of the CHAMP Follow-up module, respondents are told that in the follow-up survey, they will be asked about the child's height and weight, and they are given specific instructions on how to accurately measure the child's height and weight.

Child Health Assessment and Monitoring Program (CHAMP)

All adult BRFSS respondents with a child under the age of 18 living in their household are invited to participate in the NC CHAMP survey. The NC

CHAMP call is made approximately two weeks after the NC BRFSS interview. The NC CHAMP interviewer speaks to the adult who was identified in the NC BRFSS household as the most knowledgeable about the randomly selected child's health. All adult respondents are reminded that the survey is voluntary, that they may refuse to participate, and that they may choose not to answer any question.

Sampling design

The NC BRFSS and NC CHAMP surveys utilize disproportionate stratified random sampling (DSS). Telephone numbers are provided by the CDC/BSB and are generated from a computer in groups of 100 consecutive phone numbers that contain at least one published household telephone number. The telephone number groups are then assigned to two strata: (1) high-density or listed numbers, and (2) low-density or unlisted numbers. The listed numbers are sampled at a higher rate than unlisted numbers in an effort to achieve a higher hit rate (compared to simple random sampling) and still achieve a statistically representative sample. The ratio at which telephone numbers are sampled from each block is adjusted for through weighting when analyzing the data.

Questionnaire

Questions on the NC CHAMP survey pertain to a wide variety of health-related topics, including breastfeeding, early childhood development, health care access and utilization, oral health, mental health, physical health, nutrition, physical activity, family involvement, and parent opinion on topics such as tobacco and childhood obesity. The majority of questions on the NC CHAMP survey originate from pre-existing telephone surveys from the National Center for Health Statistics. The U.S. Census model was employed for the collection of demographic information of families and children.

Survey items are revised each year to meet the child health surveillance needs of North Carolina. NC CHAMP staff work directly with NC BRFSS staff to coordinate measurements of health behaviors between parent/adult respondents from the NC BRFSS and child interviews obtained from NC CHAMP. Questions to be included in the NC CHAMP survey each year are solicited from the

North Carolina public health community. The NC CHAMP Advisory Committee facilitates the process of survey development. Requests for inclusion of data items are reviewed and acted on by the NC CHAMP coordinator, in consultation with the NC CHAMP Advisory Committee, the NC BRFSS coordinator and SCHS. Decisions regarding which questions or modules will be included in the survey are made in the fall of the year preceding the survey. Surveillance is done on a calendar year basis. Requests for inclusion of data items are required to be submitted to NC CHAMP during the spring and summer of the year preceding the survey. Requests are reviewed based on: (1) Reason for the request, with a statement of relationship of data items to agency objectives or other appropriate strategic plan; (2) How the data will be used and analyzed by the program or agency, outlining specific analytic plans (e.g., data will be used to calculate prevalence rates; plans for complex statistical analyses); (3) The number of questions to be asked; (4) Prior use of the questions (e.g., items have been included on previous CHAMP surveys; items have been used in other states or other surveys; questions have been field tested); (5) How the topic/question(s) addresses emerging or important public health issues in children or adolescent health; and (6) How data derived from the topic/question(s) will benefit North Carolina public health.

Interviewer training and evaluation

Interviewer training is an essential element to overall quality of data collected through the SCHS Survey Center. The SCHS Survey Center utilizes the Web-based BRFSS Interviewer Training Module (available at www.cdc.gov/brfss/training) as well as other information and guidelines set by the CDC and subject matter experts from across the state. Interviewer training is designed to provide interviewers with background information about the surveys conducted at the SCHS, the purpose for the surveys, procedures for conducting computer-assisted telephone interviewing, as well as Survey Center policies. During training, emphasis is placed on standardization of the telephone interviewing process, underlining the importance of (1) reading questions verbatim; (2) abstention from engaging in unscripted casual conversations; (3) obtaining a response from the selection choices; and (4) refraining from clarifying concepts unless scripted.

Interviewer training is directed by the SCHS Survey Center Coordinator. Training session topics include: (1) background information about the surveys conducted at the SCHS Survey Center; (2) informed consent and confidentiality; (3) detailed review and discussion of the CHAMP questionnaire. Interviewers are given an opportunity to listen to a live interview as it is conducted in the survey center via the monitoring system after which critiques on the interviewer's performance are discussed. Refusal avoidance training provides tips for decreasing the likelihood of participant refusal, emphasizing interviewer voice quality, tone and pitch, as well as the importance of gaining cooperation and building rapport with respondents. An interviewer guide is located at each workstation as a reference tool and a guide of best practices.

During training, interviewer trainees engage in mock interviews and role play activities for several days in order to practice coding responses into the Wincati survey software system (Sawtooth Software Inc, 2006) and documenting results in notes. Trainees shadow an experienced interviewer and conduct their first interview with assistance from an assigned mentor. Trainees are evaluated for overall performance and their own individual readiness. Before assignment to a study, trainees must be able to: (1) communicate in their own words the basic information covered in the informed consent; (2) clearly state their name, the purpose for the call, the various agencies that they represent, how long the interview takes, and why the survey is important; (3) convey how telephone numbers are obtained and how respondents are selected; and (4) give a brief statement as to how the data will be used and provide the telephone number and Web address where additional information may be attained regarding the survey. In most cases trainees conduct their first solo interview after five days of training. Over the first two months new interviewers are closely monitored each shift and are given immediate feedback. Adjustments to the training schedule are made as necessary based on an assessment of where each interviewer is in the training process. Periodic refresher training occurs annually for each new questionnaire, monthly for questions that have changed or been added, and as indicated by the interviewer monitoring or by interviewer statistics.

Interviewer performance is evaluated by using multiple reports with SeeQC software (Comeau Associates,

Computer and CATI Consulting, at <http://clauder.com>) for objective statistical evaluation and interviewer monitoring, including: completes per contact, refusals per contact, and dialings per non-talk hour. Systematic monitoring of interviewers is ongoing such that each interviewer is monitored at least two to three times a week. All interviewer stations are loaded with monitoring software. Monitors are able to unobtrusively monitor both the audio and visual portions of interviews, and ensure that all questions are asked as written and in the correct order, accurate coding of responses, utilization of professional attitude and a positive voice, and reaction of respondents. Observations are documented and feedback discussed with the interviewers after the interview is completed to address issues related to verbatim reading, coding accuracy, probing, refusal avoidance and conversions, diction, pace, and courtesy.

Data collection

The NC BRFSS and NC CHAMP are conducted in both English and Spanish by trained interviewers at the SCHS Survey Center. Data collection is ongoing throughout the year, with interviews conducted seven days per week at varying times of the day (9 a.m. to 9 p.m.). The NC BRFSS study uses a list-assisted, two density stratum, with minority over-sample and address matching. The construction of the sample, information contained in the phone records, and process for finalizing disposition coding for all phone records contacted comply with CDC specifications. All monthly studies are set up and conducted in WinCati (Sawtooth Software Inc, 2006). Skip patterns based on child's age or responses to a previous survey item are incorporated into the computer-assisted-telephone-interviewing (CATI) programming (e.g., CATI only presents questions on school performance if the respondent indicated that the child is enrolled in school). Range checks were developed for questions on height and weight such that when an interviewer enters a value that falls below the fifth percentile or above the 95th percentile range based on child age and sex CATI will prompt the interviewer to verify the value entered.

BRFSS ELIGIBILITY

The BRFSS assesses non-institutionalized adults age 18 and older. At the beginning of the BRFSS survey, several questions establish eligibility of the

person who answers the call (see Appendix A). It is first established whether the number is to a private residence. An eligible household is a housing unit that has a separate entrance, where occupants eat separately from other persons on the property, and that is occupied by its members as their principal or secondary place of residence. Non-eligible households include: (1) vacation homes not occupied by household members for more than 30 days per year; (2) group homes (e.g., sororities and fraternities, halfway houses, shelters); and (3) institutions (e.g., nursing homes, college dormitories).

The CATI system randomly selects one adult in the household to be interviewed. Eligible respondents include members currently living in the household that are 18 years of age and older (including all related adults 18 years old or older, unrelated adults, roomers, and domestic workers who consider the household their home, even though they may not be home at the time of the call). Household members do not include adult family members who are currently living elsewhere. If more than one eligible adult currently lives in the household then one respondent is randomly selected through a pre-programmed process in the CATI data entry system used by each interviewer. The interviewer must make every attempt to interview the respondent selected and not simply interview the person who answers the phone.

All BRFSS respondents with children under the age of 18 living in their households are invited to participate in the NC CHAMP survey. Appendix D presents sample sizes and response rates for 2005–2009, including the number of adults completing the NC BRFSS, proportion reporting a child under the age of 18 living in the household, and proportion who agreed to participate in a follow-up survey on child health.

CONFIDENTIALITY

SCHS staff, including supervisors, coordinators, and interviewers, receive training on the importance of confidentiality. Interviewers are trained to respect confidentiality, assure respondents that their confidentiality is protected, and refrain from discussing details of specific interviews outside the work environment. In order to ensure confidentiality, NC CHAMP data do not contain any direct personal identifiers and respondent data are combined (i.e.,

aggregate statistical reporting). NC CHAMP data users sign a confidentiality agreement before receiving a public use dataset that is stripped of personal identifiers and only contains a unique identification number for each participant.

Weighting

The sample design used to collect the data introduces a complexity to data analysis. Failing to account for this complexity will result in biased parameter estimates and incorrect variance estimates. Analyses must correct for design effects and unequal probability of selection to ensure that results are representative with unbiased estimates. Several computer programs are available that provide the capability of variance estimation for complex sample designs (e.g., SUDAAN, STATA, SAS). In NC CHAMP, each sampled child is assigned a sampling weight, stratum identifier and primary sampling unit (PSU) code. It is necessary to include these variables when conducting data analyses and tests of statistical hypotheses.

NC CHAMP data are weighted to reflect the demographic characteristics of the North Carolina population (available at: www.census.gov/popest/estimates.html). The use of weighted data adjusts the results of the sample to better represent the entire population of North Carolina. Adjustments are made to account for the unequal probabilities of selection due to the disproportionate sampling method and due to people living in households with different numbers of residential telephone numbers and different numbers of children in the home, as well as unequal non-response rates among different demographic groups. For example, if parents of children under five constitute 10 percent of the sample respondents, but this group represents 8 percent of the total population of the state, then a factor of 0.80 would be entered into the last weighting process for these respondents to account for this discrepancy.

The following weighting formula is used to calculate the final sampling weight assigned to each child (WTFCTOR):

$$\text{WTFCTOR} = \text{STRWT} * 1 \text{ OVER NPH} * \text{CHILDREN} * \text{POSTCH}$$

Variables in the weighting formula include: STRWT = accounts for differences in the basic probability

of selection among strata (subsets of area code/prefix combinations). It is the inverse of the sampling fraction of each stratum. There is almost never a complete correspondence between strata, which are defined by subsets of area code/prefix combinations, and regions, which are defined by the boundaries of government entities; $1/NPH$ = the inverse of the number of residential telephone numbers in the respondent's household; CHILDREN = the number of children (less than 18 years of age) in the respondent's household; POSTCH = the number of children in an age-by-gender or age-by-race-by-gender category in the population of the state divided by the sum of the products of the preceding weights for the children in that same age-by-gender or age-by-race-by-gender category; adjusts for non-coverage and non-response.

Measures of height and weight

Measures of height and weight in the NC CHAMP survey are based on the proxy reports and are not independently measured. Previous studies of height and weight estimates based on parent reporting compared to independent measurement have found that, for children under 10 years of age, height was generally underreported and weight was generally over-reported.¹ NC CHAMP has found a similar trend for proxy report of child height. A greater percentage of missing values and biologically improbable values (e.g., height reported too high for child's age) were found among younger age groups than among children ages 10 and older. Because height, and therefore BMI, is not consistently available for age, the NC CHAMP reports BMI only for children ages 10 and older. For parents' report of child weight, the proportion of missing values and biologically improbable values were not found to be associated with child age.

Percentiles are the most commonly used clinical indicator to assess the size and growth patterns of individual children in the United States. Percentiles rank the position of an individual by indicating what percent of the reference population the individual would equal or exceed. For example, a 5-year-old girl whose weight is at the 25th percentile weighs the same or more than 25 percent of the reference population of 5-year-old girls, and weighs less than 75 percent of the 5-year-old girls in the reference population. Weight-for-Age percentiles are used to measure a child's weight based strictly on age. It does not take into account the height

of a child. This is not a method to determine obesity (or overweight) in children, but simply an indicator of growth as compared to children of the same age. The SAS code for calculating Weight-for-Age was obtained from the National Center for Health Statistics Web site entitled, "2000 CDC Growth Charts: United States" (available at www.cdc.gov/growthcharts). The calculations use the 2000 CDC growth charts, by age and sex, as the standard for assessing weight status. Calculation of Weight-for-Age is based on the age of the child in months. For those children where age was only available in years, children were assumed to be at the midpoint of the age-year for purposes of calculating Weight-for-Age. Outlier observations or observations that are considered to be "biologically implausible values" (i.e., values identified as too low or too high for child age) are calculated based on World Health Organization fixed exclusion ranges.

Body Mass Index (BMI)-for-Age percentiles have emerged as the favored method to measure weight status in children. BMI is calculated in the same manner for children as it is for adults: weight (in kilograms) divided by height (in meters) squared. However, because children's body fatness changes over the years as they grow, and girls and boys differ in their body fatness as they mature, BMI for children is age- and sex-specific. The SAS code for calculating BMI-for-Age was obtained from the National Center for Health Statistics' Web site entitled, "2000 CDC Growth Charts: United States" (available at www.cdc.gov/growthcharts). The calculations use the 2000 CDC growth charts, by age and sex, as the standard for assessing BMI status. Calculation of BMI-for-Age is based on the age of the child in months. For those children where age was only available in years, children were assumed to be at the midpoint of the age-year for purposes of calculating BMI-for-Age. Outlier observations or observations that are considered to be "biologically implausible values" (i.e., values identified as too low or too high for child age) are calculated based on World Health Organization fixed exclusion ranges. Categories for weight status are based on BMI-for-Age percentiles and defined as: less than 5 percent classified as underweight; between 5 and 84 percent classified as recommended range; between 85 and 94 percent classified as overweight; and greater than 95 percent classified as obese (www.cdc.gov/healthyweight/assessing/bmi/index.html).

HEIGHT AND WEIGHT CALLBACKS

Beginning in 2007, in an effort to increase accuracy in proxy report of height and weight, questions were included in the NC CHAMP survey to assess how the respondent arrived at the answer for the child's height and weight. Response options to these questions included: (1) Child told respondent his/her weight; (2) Respondent estimated or guessed child's weight; (3) Respondent used a bathroom scale/tape measure or yard stick within the past six months; (4) Child was weighed/measured at the doctor's office within the past six months; (5) Child was weighed/measured at school within the past six months; or (6) Some other way. Respondents who did not report the child's height and weight had been measured using a measuring tape or scale were asked if they would participate in a callback survey. Respondents were asked to measure the child using a measuring tape and/or scale in order to report a more accurate measurement of the child's height and weight and could either call the survey center with the updated measurements or have the survey center call the respondent back within the following week. In 2008, 29.9 percent (N = 762) were flagged for callback to update either their child's weight and/or height; 78.3 percent (N = 597) participated in the height/weight callback and provided updated measures of height (N = 315), weight (N = 64) or both height and weight (N = 218).

Results

Detailed data tables for NC CHAMP survey items are posted on the SCHS Web site on an annual basis (www.schs.state.nc.us/SCHS/champ/results.html). State level estimates are available for survey items tabulated by characteristics of the child, including sex, race, Hispanic origin, age group, school enrollment type (public/private), grade level, health insurance status, and Special Health Care Needs status, as well as parental education level. County-level estimates are not reported due to small sample sizes. Given the complex sample design of the NC CHAMP Survey (i.e., it is not a simple random sample), SUDAAN software (Research Triangle Institute, 2005) is used to calculate the point estimates and confidence intervals. This software takes into account the complex sampling design when computing the variance, or sampling error, associated with the estimates. The 95 percent confidence interval indicates the range in which the true population value would

occur 95 out of 100 times, if 100 different random samples were taken of the population. Respondents who refused to answer or did not know the answer to a survey question were excluded from calculations in the data tables. The denominator for each calculation is the number of participants who responded to the item.

Consideration should be given to both the sample size and the width of the confidence intervals. One should use caution in interpreting cell sizes less than 50. The cell size refers to either the number of respondents found in the denominator (i.e., the table column labeled 'Total Respond') or the numerator (defined by the number of respondents associated with the response categories, e.g., 'Yes-No'). It is the practice of the CDC to suppress BRFSS results if the unweighted sample size for the denominator is less than 50 or if the half-width of the confidence interval is greater than 10 percent. Although NC CHAMP does not suppress results based on these criteria, the reader should take note when this occurs and should view the corresponding results as unreliable.

Strengths and limitations

One potential limitation of the NC CHAMP survey is due to the fact that the data are reported by proxy (approximately 94% of surveys are completed by a parent; 6% by another adult, such as a grandparent). Therefore, NC CHAMP data are based on subjective parental perception of the child's health characteristics. Research suggests that parental respondents may not accurately report health risk behaviors involving their children, especially those that are illegal or socially undesirable. Inconsistency in how well parents judge child health, possibly depending on cultural and socioeconomic variables, is a limiting factor in this study. In addition, in certain cases, parents may not be aware of the health risk behaviors of their children—especially teenagers.

Another limitation is one common to all telephone surveys—the pool of respondents is limited to only those who have a telephone, leading to a lack of coverage of people who live in households without a telephone. As a result, even though the telephone numbers are randomly selected and the data are weighted to represent the statewide population of children, there are some limits to how well the data can be generalized to all North Carolina children. Previous

studies have found differences in populations with and without a telephone in demographic, economic, and health characteristics. African Americans, individuals with low incomes, living in rural areas, with less than 12 years education are less likely to live in a household with a telephone;^{2,3,4} however, differences in health indicators tend to be small.⁵ Nonetheless, results may understate the true level of risk in some of the subpopulations of children in North Carolina. Post-stratification adjustments for age, race, and sex, and other weighting adjustments help minimize the impact of these differences.⁶ In addition, previous studies have found BRFSS prevalence estimates are similar to results based on face-to-face interviews.^{7,8} Significant advantages of the telephone survey methodology include better quality control over data collection made possible by a CATI system, cost efficiency, and speed of data collection. The content of the survey questions, questionnaire design, data collection procedures, interviewing techniques, and editing procedures have been carefully developed to improve data quality and reduce the potential for bias.^{9,10}

CELL PHONE ONLY HOUSEHOLDS

Since NC CHAMP and NC BRFSS have traditionally only surveyed households with landline phones, the widespread use of cellular phones has impacted both telephone surveys. Previous studies have found differences in cell phone only compared to landline telephone populations in demographic, economic, and health characteristics. Cell phone only samples are more likely to be male, African American, Hispanic, under the age of 34, employed, of lower income, and unmarried compared to landline only samples.^{11,12} Significant differences in health care access and behaviors have also been found such that cell phone only adults are more likely to be binge drinkers, currently smoke, engage in regular physical activities, have an unmet need for medical care due to cost, and have used preventive health care services.^{13,14} However, demographic weighting adjustments greatly reduce these biases such that when data from landline telephone surveys were weighted to match population demographic characteristics, bias is similar to the margin of sampling error on the landline sample (less than 2 percentage points) for the majority of health indicators.¹⁴ Although greater bias (1–5%) has been found for some estimates of health care and

behavioral health indicators (e.g., binge drinking, smoking, financial barriers to medical care) to specific populations (i.e., young or low-income adults), bias can be attenuated to some extent through weighting adjustments.¹⁵ BRFSS post-stratification adjustments include age, race, sex, and ethnicity. The CDC is currently developing weights for the BRFSS data using raking methodology that will also allow for marital status and education to be included in the post-stratification weighting process. With the addition of education and marital status, these raked weights will yield a weighted sample that is more representative of the state's less-educated or lower-income population. Thus, the use of raked weights may further account for socio-demographic differences between cell phone only and landline populations and aid in producing less-biased estimates.

As more North Carolinians abandon landline phones and become “cell phone only,” the SCHS recognizes the importance of incorporating these households into the survey framing scheme. In 2009, the NC BRFSS added a cell phone component to its landline survey. However, fiscal constraints make expanding the surveys to include cell-phone only households difficult. Including a cell phone component substantially increases program expenditures given that cell phone interviews cost roughly two and a half times the cost for completing a landline interview. This is due to the fact that it takes significantly more time (e.g., log on hours) and effort (e.g., more dialings) per interview to complete a cell phone interview compared to a landline interview.¹⁶ Therefore, additional funding dedicated to collecting a cell phone sample will be necessary for the NC CHAMP and BRFSS to survey households that are serviced only by cell phones.

Summary

NC CHAMP is a comprehensive surveillance system in North Carolina used to assess the health characteristics of children and adolescents between ages 0 to 17. The NC CHAMP telephone survey is implemented on an annual basis through the State Center for Health Statistics' Survey Center. More information, including questionnaires, data tables, and publications, is available on the SCHS Web site at www.schs.state.nc.us/SCHS/champ.

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Appendix A

BRFSS Interviewer Script

I. Landline Telephone Survey Introduction and Screening Questions.

HELLO, I am calling for the (health department) . My name is (name) . We are gathering information about the health of (state) residents. This project is conducted by the health department with assistance from the Centers for Disease Control and Prevention. Your telephone number has been chosen randomly, and I would like to ask some questions about health and health practices.

Is this (phone number) ? If 'no': Thank you very much, but I seem to have dialed the wrong number. It's possible that your number may be called at a later time. STOP

Is this a private residence? If 'no,' Thank you very much, but we are only interviewing private residences. STOP

Is this a cellular telephone? (Read only if necessary: "By cellular telephone we mean a telephone that is mobile and usable outside of your neighborhood.") If 'yes,' Thank you very much, but we are only interviewing land line telephones and private residences. STOP

I need to randomly select one adult who lives in your household to be interviewed. How many members of your household, including yourself, are 18 years of age or older?

_____ Number of adults

How many of these adults are men? _____ Number of men

How many of these adults are women? _____ Number of women

If "1," Are you the adult? If "yes," Then you are the person I need to speak with. Enter 1 man or 1 woman below (Ask gender if necessary). If "no," Is the adult a man or a woman? Enter 1 man or 1 woman below. May I speak with [fill in (him/her) from previous question]? Go to "correct respondent" on the next page.

The person in your household that I need to speak with is _____.

To the correct respondent:

HELLO, I am calling for the (health department) . My name is (name) . We are gathering information about the health of (state) residents. This project is conducted by the health department with assistance from the Centers for Disease Control and Prevention. Your telephone number has been chosen randomly, and I would like to ask some questions about health and health practices.

I will not ask for your last name, address, or other personal information that can identify you. You do not have to answer any question you do not want to, and you can end the interview at any time. Any information you give me will be confidential. If you have any questions about the survey, please call (give appropriate state telephone number) .

Appendix B

NC BRFSS State Added Module—Random Child Selection

CATI: If no children under age 18 in the household, or refused go to next section.

If CHILDREN = 1; INTERVIEWER: “Previously, you indicated there was one child age 17 or younger in your household. I would like to ask you some questions about that child.” [Go to Q1]

If CHILDREN > 1; INTERVIEWER: “Previously, you indicated there were [number] children age 17 or younger in your household. Think about those [number] children in order of their birth, from oldest to youngest. The oldest child is the first child and the youngest child is the [second/third/fourth, etc.] child.”

CATI INSTRUCTION: RANDOMLY SELECT ONE OF THE CHILDREN.

INTERVIEWER: “I have some additional questions about one specific child. The child I will be referring to is the [Fill: random number with format, e.g., 1st child]. All of the following questions about children will be about that child.”

NOTE: If there are two children with the same birth date, randomly select one.

1. In what month and year was he/she born?

-----	Month / Year
777777	Don't know/Not sure (Probe by repeating the question)
999999	Refused

2. Is the child a boy or a girl?

1	Boy
2	Girl
9	Refused

Appendix C
NC BRFSS State Added Module—CHAMP Follow-up

“We are conducting a study to learn more about the health of children in North Carolina. The information we collect will help us improve child health services in our state. We would like to call you back within the next two weeks to ask some additional questions about this child.” If needed say, “the one we’ve just been talking about.”

1. All of the information we collect will be kept confidential. Would this be OK with you?
 - 1 Yes
 - 2 No [Go to next section]

2. Are YOU the person in the household who knows the most about the about the health and health practices of this child?
 - 1 Yes
 - 2 No (or don’t know)

- 3a. And what is your relationship to this child? IF respondent says “Mother” or “Father”
PROBE: ‘Are you his/her biological mother/father?’
 - 01 Biological mother
 - 02 Biological father
 - 03 Step/adoptive mother
 - 04 Step/adoptive father
 - 05 Grandmother
 - 06 Grandfather
 - 07 Uncle
 - 08 Aunt
 - 09 Sister or Brother (Step/foster/half/adoptive)
 - 10 Respondent’s partner or Boy/Girlfriend
 - 11 Relative of any type
 - 12 In-law of any type
 - 13 Female Guardian
 - 14 Male Guardian
 - 15 Other Non-relative
 - 16 Other Relationship Unknown
 - 77 Don’t know
 - 99 Refused

3b. Who would that person be in your household (the person who knows most about the health of the child)? IF respondent says “Mother” or “Father” PROBE: ‘Would this be his/her biological (real) mother/father?’

- 01 Biological mother
- 02 Biological father
- 03 Step/adoptive mother
- 04 Step/adoptive father
- 05 Grandmother
- 06 Grandfather
- 07 Uncle
- 08 Aunt
- 09 Sister or Brother (Step/foster/half/adoptive)
- 10 Respondent’s partner or Boy/Girlfriend
- 11 Relative of any type
- 12 In-law of any type
- 13 Female Guardian
- 14 Male Guardian
- 15 Other Non-relative
- 16 Other Relationship Unknown
- 77 Don’t know
- 99 Refused

4. Just to make sure that we are talking about the same child when we call you back, please tell me the first name of this child or his/her initials.

_____ Child’s name (If Parent refuses name, just ask for a nick name or initials.)

5. When would be the best time to call your household? Would you say—

- 1 Daytime
- 2 Evenings, or
- 3 Weekends
- 7 Don’t know/not sure
- 9 Refused

CATI: IF Q2 = 1 (BRFSS respondent also CHAMP respondent) or Q3b > 9 then show:

INT_Script1: “In our follow-up survey, we will be asking about the child’s height and weight. In the next few days, please be sure to measure the child’s height with the child’s shoes off and with {his/her} back to the wall and weigh {him/her} on a scale with {his/her} shoes off. Thank you for your willingness to participate. The rest of this survey should only take a few more minutes.”

ELSE IF Q3b = 1,3 (Mother) = 2,4 (Father) = 5 (Grandmother) = 6 (Grandfather) = 7 (Uncle) = 8 (Aunt) = 9 (Sister/Brother) then show:

INT_Script2: “Please be sure to tell (CHILD’S) [CATI fill Q3b [see CHAMP vRelate code] that we will be calling in the next two weeks. Also, please be sure that (CHILD’S) height is measured with {his/her} shoes off and weighed on a scale with {his/her} shoes off. We will be asking for (CHILD’S) height and weight in our follow-up survey. The rest of this survey should only take a few more minutes.”

Appendix D

NC BRFSS—CHAMP Sample Sizes and Response Rates, 2005–2009

	Survey Year				
	2005	2006	2007	2008	2009
Number of Adult respondents who completed the NC BRFSS	17,261	15,648	14,777	15,835	13,277
Number of NC BRFSS respondents who report a child under the age of 18 living in the household	5,581	4,758	4,334	4,565	3,868
Percent of NC BRFSS respondents who report a child under the age of 18 living in the household	32.33%	30.41%	29.33%	28.82%	29.14%
Number of NC BRFSS respondents who report a child under the age of 18 living in the household that agree to participate in NC CHAMP	4,877	3,664	3,664	3,865	3,009
Percent of NC BRFSS respondents who report a child under the age of 18 living in the household that agree to participate in NC CHAMP	89.45%	88.48%	88.74%	87.42%	84.21%
Number of Adult respondents who completed the NC CHAMP	3,973	3,135	2,715	2,987	2,370
Percent of NC BRFSS respondents who report a child under the age of 18 living in the household that agree to participate in NC CHAMP who completed the NC CHAMP	81.46%	76.54%	74.10%	77.28 %	78.76%
Percent of NC BRFSS respondents who report a child under the age of 18 living in the household who completed the NC CHAMP	71.19%	65.89%	62.64%	65.43%	61.27%

State of North Carolina
Beverly Eaves Perdue, Governor

Department of Health and Human Services
Lanier M. Cansler, Secretary
www.ncdhhs.gov

Division of Public Health
Jeffrey P. Engel, M.D., State Health Director
www.ncpublichealth.com

Chronic Disease and Injury Section
Ruth Petersen, M.D., M.P.H., Chief



State Center for Health Statistics
Karen L. Knight, Director
www.schs.state.nc.us/SCHS

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Department of Health and Human Services
State Center for Health Statistics
1908 Mail Service Center
Raleigh, NC 27699-1908
919-733-4728