
2009–2010 National Adult Tobacco Survey

Methodology Report

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Introduction

Background and Purpose of the National Adult Tobacco Survey

In 1999, the Office on Smoking and Health (OSH), a division in the Centers for Disease Control and Prevention (CDC), created the National Tobacco Control Program (NTCP) to coordinate nationwide efforts to reduce tobacco-related disease and death. The program provides funding and technical support to state^a and territorial health departments for comprehensive tobacco control programs. The four goals of the NTCP are to

- (1) Prevent initiation of tobacco use among young people.
- (2) Eliminate nonsmoker exposure to secondhand smoke.
- (3) Promote cessation among adults and young people.
- (4) Identify and eliminate tobacco-related health disparities.

The Best Practices components^b used by the NTCP to achieve these four goals are

- State and community interventions.
- Health communication interventions.
- Cessation interventions.
- Surveillance and evaluation.
- Administration and management.

In 2005, as a part of OSH's ongoing effort to develop and identify appropriate, valid, and reliable measures of program effectiveness,^c OSH released *Key Outcome Indicators for Evaluating Comprehensive Tobacco Control Programs*. Explicitly addressing goals 1, 2, and 3 of the NTCP, the report identifies and assesses 120 indicators and measures for use in evaluating tobacco control programs at the local, state, and national levels. Most, but not all, of the indicators can be measured in a general population survey.

NATS is the first adult tobacco survey designed within the framework provided by the Key Outcome Indicator (KOI) report. NATS also establishes a comprehensive framework for evaluating both the

^a State refers to the 50 states and the District of Columbia.

^b Centers for Disease Control and Prevention. *Best Practices for Comprehensive Tobacco Control Programs—2007*. Atlanta: U.S. Department of Health and Human Services; 2007.

^c The Key Outcome Indicator report is a companion to OSH's *Introduction to Program Evaluation for Comprehensive Tobacco Control Programs* (MacDonald, Starr, Schooley, Yee, Klimowski, Turner; 2001.)

national and state-specific tobacco control programs. As described below, the NATS sample design prescribes a roughly equal target number of completes to allow analyses by state.^d

The primary purpose of NATS is to evaluate the CDC's NTCP. OSH developed NATS to assess the prevalence of tobacco use and the factors related to tobacco use among adults. Specifically, NATS is meant to

- Estimate the extent to which adults engage in tobacco use behaviors.
- Assess the degree that tobacco use behaviors among adults vary as a function of gender, age, and race/ethnicity.
- Estimate the accomplishment of key short-, intermediate-, and long-term tobacco prevention and control outcome indicators found in the *Key Outcome Indicators for Evaluating Comprehensive Tobacco Control Programs* report.

NATS Methodology at a Glance

NATS was designed as a stratified, national, landline, and cell phone survey of noninstitutionalized adults aged 18 years and older. It was designed to yield data representative and comparable at both national and state levels.

Each state is divided into at least three strata—a listed landline stratum, a not-listed landline stratum, and a cell phone stratum. Some states have additional landline strata based on counties or county-equivalents. The OSH target number of landline completes per state was 1863. OSH's target number of cell phone completes per state varied in proportion to each state's population. Some states independently increased the target number of completes above the OSH targets.

OSH engaged in a prolonged and inclusive process to solicit input on the content of the questionnaire. Once a draft questionnaire was developed by a core OSH group, it was sent for review to (1) all OSH units, (2) tobacco control programs in state health departments, (3) representatives of the scientific community, and (4) other federal agencies. Excluding screening questions, the final questionnaire contained 130 questions. The largest sections in the questionnaire ask about tobacco use, cessation, secondhand smoke and smoke-free policies, tobacco-related opinions and attitudes, and demographic characteristics.

OSH contracted with ICF Macro to collect the survey data. Several states also contracted with ICF Macro to collect supplemental data. NATS was conducted from October 20, 2009, to February 28, 2010.

Respondent selection varied by phone type. For landline telephone numbers, one adult aged 18 years and over was randomly selected from households with at least one adult aged 18 years or older. Adults aged 18 years and older reached via a cell phone telephone number were selected if a cell phone was the only way they could be reached by telephone at home.^e We assumed that a cell phone was used only by the person who answered.

^d Prior to NATS, 25 states had independently conducted an Adult Tobacco Survey (ATS) with technical assistance and support from CDC's OSH. After a pilot program in conjunction with the states, OSH started regularly supporting ATS's in 2002. See CDC, 2010 for state ATS data from 2003 to 2007.

^e "In your home, is a cell phone the only way you can be reached by telephone?"

The data collection protocol for landline telephone numbers specified that telephone numbers without a final disposition code after at least 15 dialings could be assigned a final survey disposition code. For cell phone telephone numbers, a final survey disposition code could be assigned to a telephone number after a minimum of 6 dialings. The calls had to be appropriately distributed among weekdays, weeknights, and weekends.

A total of 118,581 interviews—110,634 landline interviews and 7,947 cell phone interviews—of noninstitutionalized adults aged 18 years and older were completed.

The landline data were first weighted by the probability of selection of the telephone number, the probability of selecting the respondent, and a nonresponse adjustment. The cell phone data were initially weighted only by the probability of selection of the telephone number. Next, with the use of a raking procedure, the data were poststratified by state to the joint estimated distributions of age, gender, and phone type (cell-phone-only users and all others). The poststratified weights for five states were trimmed (i.e., truncated to adjust for inflated variances).

Section I—National Adult Tobacco Survey Sample Design

1.1 Introduction

The NATS’s target population was noninstitutionalized adults aged 18 years and older residing in the 50 states or D.C. The sample design had two main objectives:

- (1) State-level estimates.
- (2) National estimates for subgroups defined by gender, age, and race/ethnicity.

For that reason, the overall sample size was determined by the need for precise state level estimates.

1.2 Sampling Frames

Respondents were selected from two sampling frames, one for landlines and one for cell phones. Each state was divided into at least three strata—a listed landline stratum, a not-listed landline stratum, and a cell phone stratum. Some states had additional landline strata based on counties or county-equivalents.

The listed stratum consisted of landline telephone numbers listed in residential directories or in other source databases. The not-listed stratum consists of landline telephone numbers not listed as a residential number in any source database.

The NATS’s landline sampling frame is composed of listed and not-listed telephone numbers from “hundred-blocks” that have at least one listed telephone number (one-plus block). A “hundred block” is a set of 100 telephone numbers with the same area code, prefix, first 2 digits of the suffix, and all possible combinations of the last 2 digits of the suffix, from 00 to 99. The landline sampling frame for the National Adult Tobacco Survey is the set of all one-plus hundred block telephone numbers in the United States.

The cell phone sampling frame consists of sets of cellular telephone numbers. For the cell phone sampling, the sets are thousand blocks, 1000 contiguous telephone numbers with the same area code and prefix. These are referred to as banks. The banks originated from the Telcordia® Local Exchange Routing Guide (LERG). These cellular-dedicated banks were then identified by coding provided by the LERG.

1.3 Sample Selection

Telephone numbers listed in residential directories and other database sources are usually working residential numbers, whereas unlisted telephone numbers include large numbers of nonworking and nonresidential telephone numbers. To increase sampling efficiency, the listed stratum was oversampled at a 1.5-to-1 ratio relative to the not-listed stratum. This raised the percentage of working residential numbers selected in the sample.

For the landline strata, each state was allocated an equal sample size. This ensured adequate precision for survey state level estimates. The total target landline sample size of 95,013 was equally distributed among the states, or 1,863 each.

For the cell phone strata, each state was allocated a sample size in proportion to the total state population. For the entire survey, the total cell phone target number of completes was 6,300.

The state samples were generated by Marketing Systems Group (MSG) through a systematic equal probability procedure. MSG then prescreened the sampled landline telephone numbers to identify unproductive telephone numbers, such as businesses and nonworking numbers.

1.4 Supplemental State Samples

States were offered an opportunity to increase their state samples. Louisiana, New Jersey, and Oklahoma added to both their landline and cell phone target number of completes. Delaware, Georgia, Iowa, North Dakota, Pennsylvania, South Carolina, and Virginia added to their landline number of completes. Table 1 shows the number of state-added completes by state and phone type.

Table 1. Number of State-Added Completes by State and Phone Type

State	State-Added Landline Completes	State-Added Cell Phone Completes	State-Added Total
Delaware	71		71
Georgia	2,808		2,808
Iowa	294		294
Louisiana	4,297	239	4,536
New Jersey	1,442	662	2,104
North Dakota	338		338
Oklahoma	1,338	457	1,795
Pennsylvania	1,290		1,290
South Carolina	3,252		3,252
Virginia	292		292
Total	15,422	1,358	16,780

1.5 Sampling Results

The resulting number of completes for each state by phone type are presented in Table 2. The presented counts of completed interviews reflect fully completed and partially completed interviews (See Appendix A).

Table 2. Landline and Cell Phone Completes: Overall and by State

State	Landline Completes	Cell Completes	Total Completes
United States	110,634	7,947	118,581
Alabama	1,902	68	1,970
Alaska	1,836	13	1,849
Arizona	1,799	111	1,910
Arkansas	2,818	50	2,868
California	1,849	723	2,572
Colorado	1,816	145	1,961
Connecticut	1,839	56	1,895
Delaware	1,966	18	1,984
District of Columbia	1,870	26	1,896
Florida	1,863	408	2,271
Georgia	4,683	231	4,914
Hawaii	1,788	33	1,821
Idaho	1,774	53	1,827
Illinois	1,805	245	2,050
Indiana	1,873	152	2,025
Iowa	2,051	76	2,127
Kansas	1,850	70	1,920
Kentucky	1,777	73	1,850
Louisiana	6,044	307	6,351
Maine	1,995	36	2,031
Maryland	1,841	134	1,975
Massachusetts	1,818	134	1,952
Michigan	1,820	184	2,004
Minnesota	1,788	116	1,904
Mississippi	1,754	57	1,811
Missouri	1,859	140	1,999
Montana	1,826	36	1,862
Nebraska	1,829	47	1,876
Nevada	1,803	51	1,854
New Hampshire	1,934	27	1,961
New Jersey	3,294	801	4,095
New Mexico	1,791	62	1,853

**Table 2. Landline and Cell Phone Completes: Overall and by State
(Continued)**

State	Landline Completes	Cell Completes	Total Completes
New York	1,838	401	2,239
North Carolina	1,815	204	2,019
North Dakota	2,192	29	2,221
Ohio	1,856	289	2,145
Oklahoma	3,123	526	3,649
Oregon	1,869	158	2,027
Pennsylvania	3,181	252	3,433
Rhode Island	1,906	26	1,932
South Carolina	5,078	88	5,166
South Dakota	1,993	32	2,025
Tennessee	1,832	127	1,959
Texas	1,882	476	2,358
Utah	2,025	83	2,108
Vermont	2,041	23	2,064
Virginia	2,271	177	2,448
Washington	1,850	196	2,046
West Virginia	1,770	45	1,815
Wisconsin	1,825	112	1,937
Wyoming	1,732	20	1,752

1.6. Respondent Selection

For landline telephone numbers, the person on the phone was asked whether or not he/she was aged 18 years or older to act as screener respondent, whether the telephone number was associated with a residence, and how many persons aged 18 years or older lived in the household. The respondent was selected randomly by age, rank, and gender—for example, the 2nd oldest male— from the total household roster.

For cell phone numbers, it was assumed that the person answering the phone was the only user of the cell phone. Cell phone respondents were “selected” once it was determined that the person answering the cell phone was aged 18 years or older.

Section II—National Adult Tobacco Questionnaire Design

2.1 Questionnaire Design Goals and Process

The NATS collected data on key short-, intermediate-, and long-term tobacco prevention and control outcome indicators. The questionnaire uses constructs from the Key Outcome Indicators report. The NATS questionnaire is built around key outcome indicators from each of OSH's four following goal areas:

- Preventing Initiation of Tobacco Use Among Young People.
- Eliminating Nonsmokers' Exposure to Secondhand Smoke.
- Promoting Quitting Among Adults and Young People.
- Identifying and Eliminating Tobacco-Related Disparities.

Given the novel content of NATS, OSH solicited state ATS users, as well as representatives of the scientific community and other federal agencies, for their advice on the questionnaire design. OSH held several conference calls and invited participation in March 2008, fall 2008, and May/June 2009. The calls were designed to involve these stakeholders in a dialogue about the questionnaire design. In March 2008, OSH engaged with the National Institutes of Health (NIH) Tobacco and Nicotine Research Interest Group (TANRIG). TANRIG's mission is to increase collaboration, coordination, and communication of tobacco- and nicotine-related research among NIH Institutes and Centers and among partnering Department of Health and Human Services (DHHS) agencies outside of NIH. TANRIG members provided feedback on the plan and design for NATS.

The next step in the survey design was to conduct cognitive interviews. ICF Macro conducted two phases of cognitive interviews—one in December 2008 (n = 39), and the other in March 2009 (n = 9). Following each phase, ICF Macro provided a written report to OSH containing feedback collected from the cognitive interviews, along with recommendations.

The report on the first phase of cognitive interviews contained question-by-question recommendations for revisions to the questionnaire items that presented comprehension, clarity, recall, or sensitivity problems for respondents. These recommendations generally fell into three categories

1. Suggested instructions for interviewers (to help them better handle complex sections of the questionnaire as well as those sections that may be sensitive for respondents).
2. Slight modification to question wording or response options.
3. Moderate question modification (either in the form of question revision or the recommendation that response options be added to the item).

The majority of recommendations involved interviewer instruction and slight wording modifications. In some instances, more than one recommendation was provided.

After the first phase of cognitive interviews, changes to the survey instrument included minor revisions to the wording of some items to enhance clarity. More notably, the revision involved the redesign of a

major section of items assessing cessation attempts and possible cessation assistance from health care providers. The report on the second phase of cognitive interviews presented findings for a limited set of new items, as well as items modified as a result of the first phase of interviews. Only a few recommended changes resulted from the second phase of interviewing. Overall, these recommendations were limited to additional interviewer instructions to better explain the tested screener items.

Modifications made after the first phase of cognitive interviews were tested successfully in the second round of cognitive interviews. For example, revisions to interviewer instructions encouraged respondents to provide single-digit answers instead of ranges. Additionally, the revised questions and skip pattern for the series of items focusing on cessation, which had been made based on feedback from the first phase of interviews, notably decreased the respondent burden.

2.2 Questionnaire Design Results

The NATS questionnaire included 130 questions (excluding the screeners). Table 3 shows the topics covered. Of the 105 tobacco-specific questions, 82 are directly related to 42 indicators in the KOI report.

Table 3. NATS Questionnaire: Number of Questions by Topic

Section	Total Number of Questions	Maximum Path	KOI Tobacco Questions	Non-KOI Tobacco Questions	Non-Tobacco Questions
General Health	1	1	0	0	1
Cigarette Smoking	29	18	12	17	0
Other Tobacco Use	13	13	10	3	0
Cessation	30	29	28	2	0
Secondhand Smoke and Tobacco-Free Policies	24	24	24	0	0
Demographic Items	15	15	0	0	15
Chronic Conditions and Diseases	7	7	0	0	7
Opinions and Attitudes	11	10	8	1	2
Total*	130	117	82	23	25

The main body of the questionnaire was nearly identical for both the cell phone and landline versions. The only exception was that the landline version contained two questions related to household landline telephone use. Since the cell phone version was designed for respondents who only use a cell phone and do not have a landline in their household, these two questions were not relevant to cell phone respondents. Thus excluding the screeners, the cell phone version contained 128 questions. The landline and cell phone versions also differed in the screener and closing sections. The landline screener included questions to randomly select one adult household member. The cell phone screener assumed that the cell phone is used only by the person who answers. The cell phone screener also contained questions to confirm that the respondent on the phone—was an adult, was not in an unsafe situation by being on the phone (e.g., driving), and did not have a landline telephone in his or her home. Because each cell phone respondent was offered an incentive for participating in the survey, the cell phone closing gathered additional information needed to provide the incentive of a \$10 gift card. Incentives were provided to cell phone respondents to address concerns associated with airtime usage charges.

Section III—National Adult Tobacco Survey Fielding

3.1 Fielding Period

NATS was fielded between October 20, 2009, and February 28, 2010. The following section provides details about advance letters, a respondent toll-free verification line, caller ID, interviewer training, quality assurance and quality control, and dialing protocols specific to landline and cell phone dialing.

3.2 Methods to Enhance Response

3.2.1 Advance Letters

Prior to the monthly sample release, ICF Macro mailed an advance letter to each household in that month's sample. Letters were printed on two sides with English on the front and Spanish on the back. ICF Macro collaborated with OSH and developed the text for the letter, translated the text into Spanish, and coordinated all aspects of the printing and mailings. The letter described the survey's purpose and importance, how the telephone number was selected, and included an ICF Macro toll-free number for respondents to call to complete the interview. A copy of the advance letter is included in "Appendix B. Advance Letters (English and Spanish)." The ICF Macro toll-free number routed the respondent to a verification line (described next).

3.2.2 Respondent Verification Line

ICF Macro provided an inbound respondent verification line. An interactive voice response (IVR) system provided prerecorded messages about NATS. Calls to the toll-free number provided in the advance letter, or to the number displayed on respondents' caller ID screens (caller ID process described later in this document) were routed to the IVR system. The IVR system offered the following menu options in English and Spanish:

- Learn more about the study.
- Speak directly to a survey representative.
- Leave a message (e.g., request removal from calling, set up an appointment).

If a respondent chose to speak to a live representative, they were routed to a supervisor in the ICF Macro research center who answered the respondent's questions, routed respondents for interviews, scheduled call-backs, or removed respondents from the call list.

A copy of the final IVR script is included in "Appendix C. National Adult Tobacco Survey Interactive Voice Response Script."

3.2.3 Caller ID

To reduce nonresponse, ICF Macro programmed a project-specific number and text that would display on any respondents' call screening devices. ICF Macro provided a unique phone number and programmed the text to display as "Macro/CDC" (i.e., it activated a caller-ID). It is important to note that what respondents see on their caller ID display depends on their service provider. Depending on the plan and the service provider, respondents with caller ID may receive both the number and text

associated with the number, only the phone number, or only the area code or state associated with the area code. In all of these scenarios; however, caller ID can help navigate past certain screening devices.

When caller ID is not activated by the survey organization, people who have privacy managers or “call block” software (this voice says “this number does not accept calls from unidentified parties”) cannot be reached. That is, without caller ID, the phone in about 4% of households will not even ring. While the text broadcasted with the caller ID may impact cooperation, broadcasting caller ID mostly allows contact with potential respondents. The direct effect is largely on the resolution rate rather than the response rate.

If a respondent called the number displayed on his or her caller ID screen, these calls were automatically routed to the NATS IVR system.

3.3 Staffing and Interviewer Training

3.3.1 Overview of NATS Staffing

NATS interviewers were recruited from ICF Macro’s existing pool of ATS and BRFSS interviewers. Both surveys used similar dialing protocols and include health- and tobacco-related questions.

3.3.2 Interviewer Training

All telephone interviewers participated in initial interviewer training that covered—the role of the interviewer in survey research, proper interviewing techniques, gaining cooperation, refusal aversion and conversion, and accessing and dispositioning sample within the CATI (Computer-Assisted Telephone Interviewing) program. This initial training included practice time using the CATI questionnaire and working through the interview. All ICF Macro employees, including interview staff, signed a statement of confidentiality.

NATS-Specific Training

After initial training and prior to conducting NATS interviews, interviewers participated in a rigorous NATS-specific training. This interviewer training ensured consistent, high-quality interviewing throughout data collection. ICF Macro’s NATS project manager created training tools, such as a training manual and a frequently-asked questions (FAQ) sheet for NATS. These documents were used during the training and were available for interviewers throughout fielding. Interviewers kept the FAQ sheet at their CATI stations, reviewed it prior to each shift, and referred to it as needed. A brief overview of topics covered in the NATS interviewer training is included in “Appendix D. NATS Interviewer Training Topics.”

3.4 Quality Assurance and Quality Control Procedures

3.4.1 Quality Assurance

To assure quality, ICF Macro conducted two rounds of pretests prior to data collection. ICF Macro project management and OSH made minor questionnaire revisions based on the results of the pretests. These revisions included—minor rewording of questions, introductory text, and closing text; the addition of interviewer notes; and minor logic changes. These changes were made to assist with respondent comprehension and to improve questionnaire flow.

3.4.2 Quality Control

ICF Macro programmed the questionnaires using Computers for Marketing Corporation's (CfMC's) Survent software package, which is designed for programming and managing CATI studies. CfMC software provides

- Call management.
 - Quota controls.
 - In-bound calling capabilities.
 - Multilingual interviewing capabilities.
 - Data back-up.
 - Monitoring.
 - Incidence tracking.^f
-
- Upon programming completion, ICF Macro project managers tested the survey. Testing included developing scenarios to test all possible paths through the questionnaire.
 - Checking frequencies of randomly generated data.
 - Verifying frequencies of the data after the first 201 completed interviews.
 - Creating an automatic skip check program (to check live data for errors), which ran nightly throughout the entire data collection period.
 - Repeating the aforementioned quality control measures any time the survey was altered during the fielding process.

To track quality control indicators, ICF Macro generated reports from the survey data file, which included summary statistics on the following:

- Interviewer efficiencies (complete interviews per hour, on both individual interviewer and project levels).
- Demographics on completed interviews.
- All call dispositions.
- Sample status (number of attempts, percentage complete, and refusal rates).

These reports were reviewed by the ICF Macro NATS project manager daily, enabling the management team to quickly detect and resolve any problems. Spot checks were performed on open-ended responses to determine the accuracy of data entry by interviewers.

Interviewer Monitoring

ICF Macro monitored interviewer performance through supervisors and Quality Assurance (QA) assistants, project management monitoring, as well as with formal and informal performance evaluations.

QA assistants monitored at least 10% of the interviews by tapping into interviewers' telephone lines and using the CATI system's monitoring module to follow the course of the interview on a computer screen. Interviewers were scored on several measures of performance designed to reinforce proper interviewing protocol.

^f Incidence is the proportion of the survey sample that is eligible to participate in the survey.

QA assistants also ensured that interviewers—coded incomplete interviews properly, left useful messages for the next interviewer, and made every attempt to complete an interview on every contact. Project management staff also monitored interviews in-progress throughout fielding. Based on their performance, interviewers received feedback and coaching, if needed. To ensure that feedback was timely and weaknesses could be addressed immediately, feedback and coaching occurred either immediately following the interviewer’s shift, or just prior to the next-scheduled shift.

3.5 Survey Protocol

NATS was fielded from ICF Macro’s CATI Research Centers in Burlington, Vermont; Springfield, Ohio; and Plattsburgh, New York. In all, 118,581 interviews were collected—110,634 via landline and 7,947 via cell phone. The average landline interview lasted 17.2 minutes, while the average cell phone interviewer lasted 20.6 minutes. Table 2 includes landline and cell phone completes by state.

Fielding protocols were based on the BRFSS survey, as adapted in recent years for CDC-OSH’s state-level ATS support. Per the protocol, each landline record in the sample was assigned a terminal disposition code. At least 15 call attempts (6 attempts for cell phones) were required before calls were ceased. Slightly different protocols were followed for the landline and cell phone samples. For example, cell phone users tend to carry their phones with them; thus, fewer attempts (six) were attempted to contact the cell phone sample.

Calling times were based on for the respondent’s time zone. Attempts were allocated to 20% weekday, 50% weekday evening, and 30% weekend. Landline dialing protocol and day-part attempts were allocated as follows:

- *Weekdays*: Monday through Friday: 9:00 AM–5:00 PM: three attempts.
- *Weeknights*: Monday through Friday: 5:00 PM–9:00 PM: seven attempts.
- *Weekends*: Saturday and Sunday: 9:00 AM–9:00 PM : five attempts.

Attempts were made until a final disposition was obtained. A final disposition was attained when

- The respondent completed the interview.
- The telephone number was found to be invalid.
- The record reached 15 attempts for landline sample or 6 attempts for cell phone sample.
- The respondent gave a final refusal.

Contacting Respondents

Interviewers followed similar protocols for landline and cell phone interviews when contacting households and potential respondents. The protocols are described next, and those unique to landline and cell phone surveys are described.

Treatment of No Answers

At least 15 contact attempts, over a minimum 5-day period (typically 30 days), were made to reach a sampled number. Once any contact was made at a residence, as many calls as necessary were made to reach the selected adult, or confirmed adult in the case of cell phone surveys.

Rings per Attempt

The telephone rang a minimum of five times on each attempt.

Busy Lines

Busy lines were called back at least twice at 10-minute intervals. If the line was still busy after the third attempt, the number was assigned a “busy” disposition and called during the next available day-part. For example, if a “busy” disposition was assigned during a Monday through Friday 9:00 AM–5:00 PM day-part, the CATI system queued the record for dialing that weekday evening (5:00 PM–9:00 PM).

Respondent Selection

Once a household was contacted, an adult was selected to participate. For landlines, the questionnaire screener asked for the number of adults in the household, how many of the adults were men, and how many were women. The CATI program then randomly selected one adult to participate. If the selected adult was the person already on the phone, the interviewer proceeded with informed consent and began the interview. If the respondent selected was not the person on the phone, the interviewer asked to speak to that individual.

The cellphone study did not randomly select adults; cell phone respondents were determined to be adults prior to beginning the interview. No proxy interviews were allowed for either the landline or cell phone interview. If the landline or cell phone respondent could not or would not participate, the record was assigned a final disposition and not called again.

No interview was conducted if

- The adult was
 - Unavailable during the survey period.
 - Unable or unwilling to participate.
 - Did not speak English or Spanish well enough to be interviewed.
- A randomly sampled phone number yielded
 - A business.
 - An institution.
 - Group quarters (e.g., nursing or in-patient hospice facilities, college\university residence halls).
 - Other strictly nonresidential space.

Informed Consent

Once the interviewer verified that he or she was speaking with the selected respondent, he or she read the following informed consent statement to the respondent:

“I won’t ask for your name, address, or other personal information that can identify you. You don’t have to answer any question you don’t want to, and you can end the interview at any time. The interview takes about 15 to 25 minutes and any information you give me will be kept private, to the extent

permitted by law. If you have any questions about this survey, I will provide a telephone number for you to call to get more information.

This call may be monitored or recorded for quality assurance.”

After reading the informed consent, the interview continued, unless the respondent declined to participate.

Language of Interviewing

NATS interviewers administered the survey in English and Spanish. If the respondent was unable to complete the interview in English, and preferred a Spanish-speaking interviewer, the call was either transferred to a Spanish-speaking interviewer (if available at the time), or a Spanish-speaking interviewer called the respondent back.

Answering Machines and Privacy Managers

Interviewers were prompted to leave answering machine messages or negotiate through privacy managers on the fourth and ninth times. A landline call resulted in a voicemail.

Landline Refusal Protocol

The NATS landline refusal protocol followed OSH’s recommended state-level ATS landline refusal protocol. To terminate calling, the protocol required two refusals by a selected respondent, or three refusals by a nonselected respondent.

Once a household or individual refused participation, specially trained refusal conversion interviewers made contact a minimum of 3-days later, to encourage survey participation.

Cell Phone

Protocols unique to the cell phone sample are described below. Cell phone sample dialing protocol and day-part attempts were as follows:

Weekdays: Monday through Friday: 9:00 AM–5:00 PM: two attempts.

Weeknights: Monday through Friday: 5:00 PM–9:00 PM: two attempts.

Weekends: Saturday and Sunday: 9:00 AM–9:00 PM: two attempts.

Cell Phone Refusal Protocol

On the first refusal by a respondent in the cell phone sample, their record was taken out of dialing and given a terminal refusal disposition.

Cell Phone Respondent Safety

A safety screening was asked of cell phone respondents to ensure that by participating in a call on their cell phone, they would not be compromising their safety (e.g., by driving and talking on the phone). While the cell phone survey screener included a safety question, interviewers were trained to schedule a call-back if a respondent indicated at any time during the call that they were driving or doing something that would make it unsafe to stay on the phone.

Answering Machines and Privacy Managers

Interviewers were prompted to leave answering machine messages or negotiate through privacy managers on the fourth time that a call resulted in voicemail.

Incentives

Respondents were notified during the informed consent that, if eligible for the survey, they would receive a \$10 gift for participating. Upon completing the interview, respondents were offered a unique Amazon.com gift code in one of three forms—immediate verbal delivery (interviewer would read the gift code to the respondent), delivery via text message, or respondents could call ICF Macro back at their convenience to request the gift code.

Section IV—Weighting

Weighting of the NATS was conducted by RTI International (Research Triangle Park, NC) under contract with CDC OSH. Complete details of the weighting methodology are provided in the NATS Weighting Methodology report. Copies may be requested from CDC OSH.

Section V—Outcome Rates

This section defines three outcome rates—a CASRO response rate, a CASRO overall response rate, and a CASRO cooperation rate. In the NATS, both full and partial completes are treated as completes. See Appendix A for the NATS definitions of full and partial completes.

The CASRO response rate assumes that the proportion of eligible cases in the cases with unknown eligibility is equivalent to the proportion of eligible cases in the sum of cases in the sample of which the eligibility or ineligibility could be determined. The CASRO response rate in equation form is

$$\frac{\text{(Number of Completes)}}{\left(\begin{array}{c} \text{Number of telephone} \\ \text{numbers definitely} \\ \text{reaching an} \\ \text{eligible respondent.} \end{array} \right) + \left(\begin{array}{c} \text{Number of telephone numbers} \\ \text{not definitely identified as} \\ \text{reaching or not reaching} \\ \text{an eligible respondent.} \end{array} \right) * \left(\frac{\text{Number of telephone numbers definitely} \\ \text{reaching an eligible respondent.}}{\text{Number of telephone numbers definitely} \\ \text{reaching or not reaching an eligible respondent.}} \right)}$$

An overall response rate assumes that all or almost all telephone numbers in the sample which have been identified as definitely or probably reaching a household also reach an eligible respondent. Following the BRFSS convention, the overall response rate for the NATS assumes that 98% of telephone numbers identified as definitely or probably reaching a household does reach an eligible respondent. Thus, the overall response rate in equation form is

$$\frac{\text{(Number of Completes)}}{\left(\begin{array}{c} \text{Number of telephone} \\ \text{numbers definitely} \\ \text{reaching an} \\ \text{eligible respondent.} \end{array} \right) + .98 * \left(\begin{array}{c} \text{Number of telephone numbers} \\ \text{identified as definitely or} \\ \text{probably reaching a household.} \end{array} \right)}$$

A cooperation rate is a proportion with the number of completed interviews in the numerator and the number of selected respondents who spoke with an interviewer in the denominator.

Table 4 shows the CASRO, overall and cooperation rates. For all states combined and for all telephone numbers, the CASRO rate is 37.6%, the overall rate is 12.3%, and the cooperation rate is 62.3%.

Table 4. National Adult Tobacco Survey Outcome Rates by State and Phone Type

State	N	CASRO Response Rate	Overall Response Rate	Cooperation Rate
United States				
Total	2,424,342	37.6%	12.3%	62.3%
Landline	2,027,446	40.4%	15.6%	61.9%
Cell	396,896	24.9%	3.1%	68.7%
Alabama				
Total	43,313	36.3%	11.5%	60.0%
Landline	40,322	36.8%	12.3%	59.7%
Cell	2,991	32.0%	4.1%	70.1%
Alaska				
Total	30,648	46.4%	19.5%	67.1%
Landline	30,104	46.7%	19.9%	67.1%
Cell	544	34.9%	5.1%	68.4%
Arizona				
Total	39,560	37.3%	12.1%	62.0%
Landline	35,636	38.7%	13.7%	61.3%
Cell	3,924	26.0%	4.2%	77.1%
Arkansas				
Total	51,235	41.1%	17.0%	58.7%
Landline	49,279	41.5%	17.8%	58.6%
Cell	1,956	33.8%	4.8%	69.4%
California				
Total	72,424	28.4%	6.5%	62.7%
Landline	38,035	35.2%	11.9%	60.2%
Cell	34,389	21.8%	3.0%	69.9%
Colorado				
Total	37,127	40.3%	13.8%	64.7%
Landline	32,257	42.8%	16.7%	64.3%
Cell	4,870	24.0%	4.4%	70.7%

Table 4. National Adult Tobacco Survey Outcome Rates by State and Phone Type (Continued)

State	N	CASRO Response Rate	Overall Response Rate	Cooperation Rate
Connecticut				
Total	40,440	33.6%	10.6%	61.6%
Landline	36,891	35.2%	12.0%	61.5%
Cell	3,549	18.5%	2.2%	65.1%
Delaware				
Total	35,493	36.4%	13.3%	62.8%
Landline	34,556	36.8%	13.7%	62.9%
Cell	937	20.0%	2.9%	58.1%
District of Columbia				
Total	52,698	44.6%	11.9%	68.7%
Landline	51,880	44.9%	12.2%	68.5%
Cell	818	22.5%	4.3%	81.3%
Florida				
Total	63,586	33.1%	8.0%	61.0%
Landline	45,464	37.0%	11.6%	59.0%
Cell	18,122	23.8%	3.3%	71.7%
Georgia				
Total	105,632	35.9%	12.5%	59.7%
Landline	96,530	37.0%	14.0%	59.4%
Cell	9,102	25.5%	4.0%	66.4%
Hawaii				
Total	52,761	37.5%	11.4%	58.3%
Landline	51,293	38.1%	12.0%	58.3%
Cell	1,468	16.8%	3.0%	61.1%
Idaho				
Total	31,537	44.6%	17.2%	64.8%
Landline	29,851	45.5%	18.5%	64.5%
Cell	1,686	29.7%	5.1%	74.6%

Table 4. National Adult Tobacco Survey Outcome Rates by State and Phone Type (Continued)

State	N	CASRO Response Rate	Overall Response Rate	Cooperation Rate
Illinois				
Total	51,904	36.3%	9.8%	61.4%
Landline	39,523	39.9%	13.7%	60.7%
Cell	12,381	25.8%	3.2%	66.9%
Indiana				
Total	33,918	38.3%	14.4%	61.7%
Landline	27,750	41.6%	18.8%	60.8%
Cell	6,168	25.8%	3.7%	76.0%
Iowa				
Total	35,345	44.3%	18.2%	63.2%
Landline	32,347	45.5%	20.4%	62.6%
Cell	2,998	36.9%	4.6%	82.6%
Kansas				
Total	28,317	44.7%	18.8%	66.3%
Landline	25,482	46.1%	21.3%	65.9%
Cell	2,835	36.0%	4.6%	76.9%
Kentucky				
Total	36,352	37.7%	12.9%	60.6%
Landline	32,077	39.4%	15.1%	60.5%
Cell	4,275	26.2%	2.9%	64.0%
Louisiana				
Total	185,797	31.2%	9.7%	52.7%
Landline	160,328	32.4%	11.7%	52.5%
Cell	25,469	27.3%	2.3%	58.4%
Maine				
Total	29,167	44.5%	19.3%	64.8%
Landline	27,653	45.5%	20.7%	64.8%
Cell	1,514	26.1%	3.9%	64.3%

Table 4. National Adult Tobacco Survey Outcome Rates by State and Phone Type (Continued)

State	N	CASRO Response Rate	Overall Response Rate	Cooperation Rate
Maryland				
Total	40,260	36.5%	11.3%	66.0%
Landline	34,699	38.9%	13.6%	65.5%
Cell	5,561	21.6%	3.4%	72.8%
Massachusetts				
Total	36,380	36.4%	12.2%	63.7%
Landline	29,818	39.5%	15.6%	63.3%
Cell	6,562	24.0%	3.1%	70.5%
Michigan				
Total	43,530	38.6%	11.6%	63.1%
Landline	33,819	43.2%	16.8%	62.6%
Cell	9,711	23.5%	2.9%	68.4%
Minnesota				
Total	32,786	42.2%	15.6%	65.1%
Landline	27,670	45.3%	20.0%	64.8%
Cell	5,116	26.3%	3.6%	70.7%
Mississippi				
Total	47,120	36.2%	11.0%	56.3%
Landline	44,183	36.4%	11.7%	55.9%
Cell	2,937	38.6%	4.1%	73.1%
Missouri				
Total	32,281	39.7%	15.2%	62.4%
Landline	26,521	42.9%	19.6%	61.8%
Cell	5,760	26.9%	3.8%	72.5%
Montana				
Total	27,478	49.3%	21.5%	68.1%
Landline	26,357	49.7%	22.4%	67.9%
Cell	1,121	46.4%	7.1%	83.7%

Table 4. National Adult Tobacco Survey Outcome Rates by State and Phone Type (Continued)

State	N	CASRO Response Rate	Overall Response Rate	Cooperation Rate
Nebraska				
Total	36,318	42.5%	15.8%	62.0%
Landline	34,465	43.0%	16.9%	61.6%
Cell	1,853	37.8%	4.7%	82.5%
Nevada				
Total	39,501	34.7%	11.6%	58.5%
Landline	36,895	35.8%	12.8%	58.3%
Cell	2,606	20.4%	2.8%	65.4%
New Hampshire				
Total	28,600	41.8%	17.2%	66.3%
Landline	27,170	42.6%	18.4%	66.2%
Cell	1,430	28.5%	3.1%	75.0%
New Jersey				
Total	145,473	27.6%	5.4%	61.3%
Landline	75,922	35.2%	11.1%	61.3%
Cell	69,551	20.2%	1.7%	61.2%
New Mexico				
Total	37,991	41.5%	13.7%	64.3%
Landline	35,963	42.1%	14.6%	63.8%
Cell	2,028	33.2%	5.0%	81.6%
New York				
Total	56,754	32.4%	8.1%	63.5%
Landline	37,687	38.9%	13.2%	62.6%
Cell	19,067	20.0%	2.9%	67.9%
North Carolina				
Total	39,134	36.8%	12.0%	63.4%
Landline	30,224	41.0%	16.5%	63.2%
Cell	8,910	23.5%	3.5%	65.2%

Table 4. National Adult Tobacco Survey Outcome Rates by State and Phone Type (Continued)

State	N	CASRO Response Rate	Overall Response Rate	Cooperation Rate
North Dakota				
Total	33,782	46.4%	21.8%	64.3%
Landline	32,993	46.8%	22.5%	64.2%
Cell	789	32.4%	6.1%	74.4%
Ohio				
Total	42,069	36.9%	12.0%	62.2%
Landline	30,939	41.4%	17.6%	60.8%
Cell	11,130	26.0%	4.0%	72.6%
Oklahoma				
Total	75,784	36.0%	11.4%	61.0%
Landline	49,554	40.0%	17.7%	59.8%
Cell	26,230	32.1%	3.7%	69.0%
Oregon				
Total	30,736	44.9%	17.7%	68.0%
Landline	26,820	47.7%	21.2%	67.7%
Cell	3,916	25.1%	5.9%	71.2%
Pennsylvania				
Total	55,784	35.7%	13.4%	63.5%
Landline	43,514	39.7%	18.3%	63.0%
Cell	12,270	23.5%	3.1%	70.0%
Rhode Island				
Total	29,842	37.6%	15.4%	62.5%
Landline	28,730	38.2%	16.2%	62.3%
Cell	1,112	25.0%	3.3%	81.3%
South Carolina				
Total	86,096	38.7%	15.8%	61.7%
Landline	81,667	39.6%	17.1%	61.7%
Cell	4,429	23.7%	3.1%	65.2%

Table 4. National Adult Tobacco Survey Outcome Rates by State and Phone Type (Continued)

State	N	CASRO Response Rate	Overall Response Rate	Cooperation Rate
South Dakota				
Total	36,169	47.6%	20.0%	64.1%
Landline	35,198	47.8%	20.7%	63.8%
Cell	971	42.2%	6.5%	84.2%
Tennessee				
Total	39,348	36.9%	12.2%	61.5%
Landline	33,292	39.7%	15.3%	61.2%
Cell	6,056	22.2%	3.1%	67.6%
Texas				
Total	67,211	33.6%	8.0%	61.7%
Landline	44,926	39.1%	12.8%	60.4%
Cell	22,285	23.0%	3.2%	67.3%
Utah				
Total	33,315	43.3%	17.7%	65.5%
Landline	30,834	44.5%	19.6%	65.1%
Cell	2,481	29.2%	5.3%	76.1%
Vermont				
Total	24,872	49.1%	22.3%	72.2%
Landline	24,098	49.9%	23.4%	72.1%
Cell	774	29.1%	4.4%	82.1%
Virginia				
Total	45,812	36.5%	12.2%	64.0%
Landline	38,228	39.4%	15.2%	63.5%
Cell	7,584	23.2%	3.4%	70.5%
Washington				
Total	36,839	40.3%	13.5%	66.1%
Landline	30,425	44.0%	17.5%	65.5%
Cell	6,414	22.9%	4.3%	72.3%

Table 4. National Adult Tobacco Survey Outcome Rates by State and Phone Type (Continued)

State	N	CASRO Response Rate	Overall Response Rate	Cooperation Rate
West Virginia				
Total	26,396	36.1%	14.9%	61.2%
Landline	24,419	37.2%	16.2%	60.9%
Cell	1,977	26.0%	3.5%	73.8%
Wisconsin				
Total	30,965	41.9%	16.2%	64.4%
Landline	25,409	44.4%	20.3%	64.1%
Cell	5,556	32.8%	3.8%	67.9%
Wyoming				
Total	28,462	47.5%	19.6%	67.3%
Landline	27,749	47.7%	20.1%	67.1%
Cell	713	47.9%	6.2%	87.0%

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Appendix A: NATS Definitions and Calling Rules for Complete and Partially Complete Interviews for Landline and Cell Phone Surveys

110 Landline: Complete

Definition: Selected respondent meets the criteria for a partial complete and has completed the interview through the last question.

Calling Rules: Give final disposition code^g upon completion of interview.

120 Landline: Partial complete

Definition: Four or more questions from among gender, age, multiple race, Hispanic origin (Hispanic), marital status, education, employment, and “Do you have more than one landline telephone number in your household?” (telnosgt1) have been answered with a response other than Don’t Know/Not Sure (7, 77, or 777) or Refused (9, 99, or 999).

Calling Rules: Make a second attempt to fully complete the interview after first refusal or termination. Give final disposition code if second attempt to fully complete the interview is unsuccessful. Give final disposition code on the 15th or subsequent call attempt even if there is only one occurrence of a refusal or termination.

Note: A partial complete counts as a completed interview.

110 Cell Phone: Complete

120 Cell Phone: Partial complete

Cell phone respondents are not asked the landline telephone question (telnosgt1), thus cell phone interviews are defined as complete/partial if they answer three or more questions from among gender, age, multiple race, Hispanic origin(Hispanic), marital status, education, and employment with a response other than Don’t Know/Not Sure (7, 77, or 777) or Refused (9, 99, or 999).

^g The American Association for Public Opinion Research. 2009. *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. 6th edition. AAPOR.

Appendix B. Advance Letters (English and Spanish)

[DATE]

Dear Resident,

We are writing to ask for your help with an important study being conducted by the Centers for Disease Control and Prevention (CDC). We are gathering information from adults on health and tobacco. Your phone number was chosen randomly from phone numbers across the United States. ICF Macro, a health research company, will call you. They will identify themselves as calling for the CDC. If the call comes at a busy time, please give the interviewer a better time to call you back.

The interview takes about 15–25 minutes and can be completed when ICF Macro calls or at a later time. You can call, toll-free, 877-363-3246 if you have any questions or if you want to schedule a convenient time for you to complete the interview.

CDC will use the data collected by this study to develop more effective public health programs to help people quit smoking and to help keep people from starting to smoke.

Your participation is completely voluntary, and you may choose not to answer any question or to end the interview at any time. If you do not wish to participate, be assured there is no penalty or loss of benefit to which you may otherwise be entitled. If you do participate, your answers to survey questions will be kept private, to the extent permitted by law. No person or household will be identified in any reports from the study.

We hope you will take the time to help with this important research.

Thank you for your assistance. If you have any further questions, please call 877-363-3246.

Sincerely,

Dana Shelton, MPH
Acting Director
Office on Smoking and Health

[DATE]

Estimado residente:

Nos dirigimos a usted a fin de solicitarle su colaboración para un importante estudio que están realizando los Centros para el Control y la Prevención de Enfermedades (Centers for Disease Control and Prevention, CDC). Estamos en proceso de reunir información de adultos sobre la salud y el tabaco, y su número telefónico fue seleccionado al azar de entre números de todos los EE. UU. Una empresa de investigación sobre la salud, ICF Macro, se pondrá en contacto con usted. Para identificarse, le dirán que lo llaman en nombre de los CDC. Si lo llaman en un momento inoportuno, indíquele al entrevistador un horario para que vuelva a llamarlo.

La entrevista lleva entre 15 y 25 minutos, y puede completarse cuando ICF Macro lo llame o bien después. Usted puede llamar a la línea gratuita 877-363-3246 si tiene alguna pregunta o si desea coordinar un momento más conveniente para realizar la entrevista.

Los CDC utilizarán la información recabada en este estudio para desarrollar programas de salud pública más eficaces a fin de ayudarle a la gente a dejar de fumar y a evitar que empiece a hacerlo.

Su participación es de carácter totalmente voluntario. Además, usted puede optar por no responder a alguna de las preguntas o por dar por finalizada la entrevista en cualquier momento. En caso de que no desee participar, tenga la seguridad de que no habrá sanciones ni pérdida de beneficios a los cuales pueda tener derecho de otro modo. Si participa, sus respuestas a las preguntas de la encuesta serán privadas, tal como lo permite la ley. En los informes de este estudio no se identificará a ninguna persona ni familia.

Esperamos que decida dedicar un tiempo para colaborar con esta importante investigación.

Agradecemos su colaboración. Si tiene alguna otra pregunta, llame al 877-363-3246.

Atentamente,

Dana Shelton, MPH
Acting Director
Office on Smoking and Health

Appendix C. National Adult Tobacco Survey Interactive Voice Response Script

*Hello, you have reached the phone line for the National Adult Tobacco Survey, which is sponsored by the US Centers for Disease Control and Prevention, commonly known as CDC. The National Adult Tobacco Survey is an important study about tobacco-related experiences and opinions of **all** adults aged 18 years or older throughout the United States. If you would like to continue in English, please press **1**. Si desea continuar en español marque el **3** ahora.*

- *If you would like to learn more about the study, please **press 1**.*
- *If you would like to speak to a survey representative for more information, to take the survey now, to schedule a time to take the survey, or to decline the survey, please **press 2**.*

Scripts for the following options:

*1. CDC has contracted with ICF Macro, a health research company, to conduct interviews for the National Adult Tobacco Survey. Phone numbers are randomly selected to be called. Participation in the survey is voluntary, and **answers to survey questions are private, to the extent permissible by law**. The National Adult Tobacco Survey will interview over 98,000 people. This important survey starts in September 2009, and will end by March 2010.*

*If you would like to speak to a survey representative for more information, to take the survey now, to schedule a time to take the survey, or to decline the survey, please press **2**.*

2. Transfer call to a call room supervisor who will address concerns, attempt to convert the refusal (if necessary), and then remove the number from the study if still requested.

Voicemail box script

If no representative is available, caller is routed to the following message on a dedicated Voicemail box:

You have reached the private voicemail for the National Adult Tobacco Survey. The survey center is closed or all survey representatives are busy at this time. If you would like to be contacted by a survey representative from ICF Macro, please leave a brief message, including your name, your phone number, and when you would like to be called back. Your interest in this study is greatly appreciated. Thank you and we look forward to talking with you soon.

Appendix D. NATS Interviewer Training Topics

Background, purpose, and data usage—background on the NATS project, how NATS fits into the context of other state-level ATS work, the purpose of the national data collection effort, and how the NATS data might be used.

Importance of conducting high-quality interviews—a review of the interviewer’s role in data collection for NATS.

Fielding schedule and interview targets—discussion of the monthly fielding schedule and the target number of completes for landline and cell.

Sample design and source—overview of how the sample was drawn and generated, where it came from, and how it related to (and affected) fielding and dialing.

Representing the entire population—discussion of the sample plan as it pertained to reducing bias, as well as a discussion of random household selection.

Dialing and survey protocols—review of the dialing protocol, such as the number of attempts, description of the 3 day-parts (Monday through Friday 9:00 AM–5:00 PM; Monday through Friday 5:00 PM–9:00 PM; Saturday and Sunday 9:00 AM–9:00 PM), answering machine and privacy manager protocols, and the refusal protocol.

Project team and roles—introduction of key project team members’ names and roles on the project.

Telephone interviewing skills—review of basic interviewing skills, including elements of proper telephone interviewing, dealing with refusals, handling problem situations, probing and clarifying, and reading verbatim.

Overview of the questionnaire—review of anticipated survey length, challenging questions, terminology and pronunciations of unique or difficult words, and specific response categories. Discuss the differences between landline and cell questionnaires.

Review of respondent frequently-asked questions and how to respond to them—included refusal aversion and conversion practice as well as role-play exercises.

CATI practice time—during practice, each interviewer worked on a computer terminal and completed each screen of the CATI survey questionnaire. Many different scenarios—such as a variety of respondent reactions, skip patterns, and disposition protocols—gave the interviewer a better understanding of the CATI program and the questionnaire. ICF Macro project management and supervisory staff were on-hand to answer questions, troubleshoot, and assist interviewers.

Q and A—discusses the interviewer questions related to the NATS program or any training topic.