MINNESOTA ADULT TOBACCO SURVEY

MATS 2014 Methodology Report

TOBACCO USE IN MINNESOTA

2014 Update

January 2015

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1. Introduction

The Minnesota Adult Tobacco Survey (MATS) is a comprehensive surveillance initiative designed to monitor progress toward meeting the goal of reducing tobacco use among Minnesotans. The major objective of MATS is to collect in-depth public health surveillance data on the adult population of Minnesota, focusing on tobacco use and cigarettes in particular. MATS is the most comprehensive source of information about smoking prevalence, behaviors, attitudes and beliefs in the adult Minnesota population; further, MATS provides valid scientific data that track the impact of comprehensive tobacco control efforts in Minnesota. MATS 2014 is the fifth survey in this ongoing surveillance initiative.

The MATS surveillance initiative and the first three surveys—1999, 2003 and 2007—were directed by three partner organizations who lead comprehensive tobacco control efforts in the state of Minnesota: ClearWay Minnesota℠, Blue Cross and Blue Shield of Minnesota (Blue Cross) and the Minnesota Department of Health (MDH). For MATS 2010 and MATS 2014, the partners were ClearWay Minnesota and MDH, who selected Westat as the survey vendor for MATS 2014, made key decisions about survey design and provided oversight for the instrumentation, data collection, analyses and reporting of findings.

ClearWay Minnesota℠ is an organization that works to reduce tobacco's harm in Minnesota. An independent nonprofit organization funded by Minnesota's tobacco settlement, ClearWay Minnesota's mission is to enhance life for all Minnesotans by reducing tobacco use and secondhand smoke exposure through research, action and collaboration. Created in 1998 and funded to conduct tobacco-control work over a period of 25 years, the organization is a state leader in research, smoking cessation, media and public policy initiatives. ClearWay Minnesota has provided more than 100,000 Minnesotans with quit-smoking help through its free QUITPLAN® Services, advanced health policies including a statewide smoke-free law and tobacco price increases, broken ground in research, formed partnerships within diverse communities to reduce tobacco's burden and created many innovative programs.

The Minnesota Department of Health launched the first state-funded tobacco control program in the nation in 1985 with a portion of the proceeds from a cigarette tax. Since then, MDH has undertaken a number of tobacco control initiatives including participating as one of 17 American Stop-Smoking Intervention Study demonstration states, a national-level comprehensive tobacco control program sponsored by the National Cancer Institute. Funds from an endowment from the state's 1998 settlement with the tobacco industry were available to the department from 2000 through 2003 and were used to launch a comprehensive youth prevention initiative during that period. Currently, MDH works to reduce smoking through grants to reduce youth exposure to pro-tobacco influences, to create tobacco-free environments and to reduce tobacco related health disparities.

Through a competitive process, ClearWay Minnesota and MDH selected **Westat**, a leading health and social science research organization based in Rockville, MD, as the survey vendor for MATS 2014. Westat was also the survey vendor for MATS 2007 and MATS 2010. Westat contributed technical expertise in sampling, weighting, and survey and analytical methods. With detailed direction from ClearWay Minnesota and MDH, Westat designed MATS 2014 and collected, analyzed and reported on MATS 2014 data. As a full-service vendor, Westat made recommendations to ClearWay Minnesota and MDH for adjustments to the previous MATS effort to accommodate changing information needs.

The main components of MATS 2014 were as follows:

- **Sampling:** developing and drawing statistical survey samples of Minnesota residents. The sample design called for a random-digit dialing (RDD) sample of the adult Minnesota population, using samples drawn from landline and cell phone sampling frames. MATS 2014 differed from previous MATS by including a sample stratified by the eight geographic regions of the state. To allow accurate statewide estimates as well as a sufficient sample size from each region, regions with relatively small populations were over-sampled while the largest regions were under-sampled.
- **Questionnaire Development and Data Collection:** developing and administering a survey questionnaire that would collect all the data items needed to support the larger health and tobacco-related missions of the

sponsoring organizations. The questionnaire covered domains such as general physical health, cigarette smoking and other tobacco use (including e-cigarettes), smoking cessation, experience with health care provider smoking interventions, attitudes towards smoking, exposure to secondhand smoke in various settings, the effects of public and private policies and rules on smoking behaviors and perceptions, and demographic information. The questionnaire was administered using a computer-assisted telephone interviewing (CATI) system.

- **Survey Operations:** developing various operational procedures to support the administration of the questionnaire. These included carefully constructed rules and procedures for calling attempts to maximize contact likelihood, intensive training of data collectors to maximize respondent cooperation and ongoing quality control through data review and monitoring. Operations also included supporting measures such as contact letters and an informational website.

- **Sample Weighting:** designing and creating sets of survey sample weights that can be used in analysis and reporting to make the sampled respondents' data statistically representative of the entire population they were designed to represent. Weights were based on the probability of selection into the sample as adjusted to selected available characteristics and counts of the adult Minnesota population. Survey weights were developed for the combination of landline and cell phone samples that is to be used for analysis and reporting on the overall Minnesota population. The weighting approach included weights based on region so that surveys from each region reasonably matched the region's characteristics and so that the weighted data matched statewide control totals for demographics and for regional distribution.

- **Tabulation and Analysis:** designing the various in-depth analyses of the survey data needed to support the sponsors' current and future programmatic, advocacy, public health, and tobacco-related health care delivery activities, as well as developing the detailed analytical tools and specifications for tabulating and analyzing the data.

- **Reporting:** preparing an in-depth report profiling the adult Minnesota population in regard to the use, knowledge, attitudes, and experiences surrounding tobacco/cigarette use, tobacco cessation, exposure to secondhand smoke, and other tobacco and health-related areas.

MATS 2014 data will report the prevalence of tobacco use, exposure to secondhand smoke and related factors as of 2014 and will measure changes in these variables over time since MATS 2010, as well as monitor general trends from 1999 to 2014. In this context, a critical objective for MATS 2014 was to maintain continuity with the previous MATS surveys for survey items that remained of interest in 2014. This continuity served primarily to support reliable tracking of population trends over time and to support inferential statements that observed significant changes over time reflect actual changes in the population and are not artifacts of differences in the survey design.

Comparability was also an objective for the design of the survey weights. Investigators from the University of Minnesota weighted MATS 1999 and MATS 2003 in accordance with generally accepted practices, such as CDC's BRFSS and other statewide tobacco surveys. At that time, these surveys generally post-stratified only on age and gender. In recent years, however, concern has grown among the research community regarding the representativeness of telephone survey samples, particularly in terms of educational attainment. Telephone surveys increasingly appear to be more likely to reach individuals with higher education attainment (e.g., those with college degrees) than those with less education (e.g., those with a high school diploma or those who did not complete high school). While this phenomenon is not altogether new to survey research, the magnitude of the problem seems to have increased rapidly in the recent past. Because smoking and education status are inversely associated, ClearWay Minnesota, MDH and Westat chose to include education as an adjustment factor for MATS 2007, MATS 2010 and MATS 2014. Applying similar logic, race/ethnicity was also included as an additional adjustment factor as smoking prevalence and sample coverage have both been shown to vary by race/ethnicity population groups. To facilitate the most accurate comparisons between years of MATS administrations, the data from MATS 1999 and MATS 2003 were reweighted in 2007 to include educational attainment and race/ethnicity. Therefore, estimates from MATS 1999 and 2003 presented in MATS 2014 reports may vary slightly from estimates reported in publications prior to 2007.

1.2 Orientation to the Methods Report

This report constitutes the public documentation of general technical aspects of the MATS 2014 survey. It covers the sampling (Chapter 2), questionnaire development and

data collection methodology (Chapter 3), the operational results of the data collection (Chapter 4), the sample weighting (Chapter 5), and a discussion of comparability to previous MATS and limitations (Chapter 6). Appendices include the MATS 2014 questionnaire, letters used in contacting the survey sample members, and the contents of a website that was created to provide information about the survey to potential respondents. The MATS 2014 analysis and reporting components are outside of the scope of this survey methods report and appear as a separate, in-depth analytical report, titled *Tobacco Use in Minnesota: 2014 Update* (Minneapolis, MN: ClearWay Minnesota℠ and Minnesota Department of Health; January 2015). This report can be found at www.mnadulttobaccosurvey.org.

The day-to-day development and conduct of MATS 2014 required many detailed, internal design, specification, and reporting documents and tools that are beyond the scope of this report. The Minnesota Adult Tobacco Survey 2014 Comparability Report[1] (Westat, August 2014) itemized the areas where MATS 2014 conformed to or diverged from MATS 2010, along with descriptions of the rationale for any differences and their potential impact on comparability as they might affect the findings of trends over time from MATS 2010 to MATS 2014.

1.3 Data Collection and Data Processing Timeline

Westat's work on the development of the MATS 2014 survey began in September 2013. Data collection concluded in July 2014 and final quality assurance checks of the data and post-coding of open-ended responses were completed by August 2014. Table 1-1 shows the timeline for the major activities of MATS 2014 from survey design through creation of the weighted data sets. Analysis and reporting activities are not included in this timeline.

[1] Readers interested in more information about this report may contact Ann St. Claire, ClearWay Minnesota, at (952) 767-1416 or astclaire@clearwaymn.org.

Table 1-1. Timeline of MATS 2014 development, data collection and data preparation

Date	Task
Summer 2013 - 9/16/13	Select Westat as survey vendor, begin survey development
9/16/13	Hold kick-off meeting with Westat, ClearWay Minnesota and MDH
9/17/13-2/16/14	Design, program and internally test MATS 2014 CATI questionnaire
9/17/13-2/16/14	Develop data collection protocols and supporting materials
9/17/13-2/16/14	Design samples, create sampling frames, draw and process sample for data collection
2/3/14-2/9/14	Conduct RDD pilot test and revise questionnaire
2/13/14-2/16/14	Initial telephone interviewer training
2/17/14-7/10/14	Telephone data collection
7/11/14-8/29/10	Final data quality assurance, post-coding, and weights for review & acceptance

2. Sampling

The MATS 2014 used dual-frame landline and cell phone Random Digit Dialing (RDD) sampling with geographic regions (groups of counties in Minnesota) as the sampling strata. The list-assisted RDD landline frame covers all the landline numbers offered by traditional telephone companies as well as cable and VoIP providers. The cell phone frame contains all the possible cell phone numbers in the activated "1000-blocks". As in the MATS 2010, the MATS 2014 employed a take-all approach for the landline sample and a screening for cell phone only ("cell-only") and cell phone mostly ("cell-mostly") approach for the cell phone sample. The target numbers of completed interviews were 5,370 from the landline sample and 3,890 from the cell phone sample. In terms of the reliability of the Minnesota adult smoking prevalence rate to be estimated from the combined dataset, MATS 2014 was designed to detect a 2 percentage point difference between two point estimates, one for 2010 and one for 2014, with 80 percent probability at the 95 percent confidence level, based on a one-tailed significance test. A single CATI questionnaire was used for both the landline and cell phone samples for the extended interview.

2.1 Stratified Dual-Frame Landline and Cell Phone Samples

2.1.1 Dual Frame Design: Landline Sample

For the landline sample, a new and enhanced RDD sampling frame was used to improve the coverage of the inference population. In recent years, an increasing number of households have been shifting from traditional landline to alternative providers (including cable companies and Voice over Internet Protocol (VoIP) providers), which are not covered by the type of sampling frame used in the MATS 2010. According to the sampling frame vendor Marketing Systems Group (MSG), the new frame accounted for nearly all landline telephone numbers (published and unpublished), including those offered by traditional telephone companies (referred to as incumbent local exchange carrier (ILEC) as well as cable and VoIP providers (referred to as competitive local exchange carriers (CLEC). That is, the new landline RDD sampling frame included

virtually all the active residential landline telephone numbers and eliminated concerns about the under coverage of residential landline numbers in the United States. It is important to note that using this newer sampling frame does not bring in any new population, but simply covers the part of the inference population that would have been missed in a frame containing only ILEC landline numbers (which is the type of frame used in MATS 2010). Sampling from this new and enhanced frame helps maintain comparable non-sampling error structure for the MATS 2010 and MATS 2014. The sampling rates varied by the geographic region the telephone number was associated with, as will be discussed in Section 2.1.3 in greater detail.

2.1.2 Dual Frame Design: Cell Phone Sample

The cell phone sampling frame had been introduced during the MATS 2010 to include the coverage of the persons living in cell-only households and improve the coverage of the persons living in cell-mostly households. The MATS 2014 used the same approach to screen for cell-only and cell-mostly population. That is, the MATS 2014 cell phone RDD screener asked questions about the household usage of both landline and cell phones. Then those cell phone screener respondents living in the cell-only and cell-mostly households were eligible for the extended interview, while those living in the landline-mostly households were dropped from the extended interview.

Cell-Only Households

It is well established that the exclusion of cell-only households creates under coverage bias in the landline RDD surveys. The number of adults living the cell-only households had increased to 34.4 percent in Minnesota in 2012.[2] The coverage concerns were even greater for younger adults. Studies of cell phone users have also found that the characteristics of the adults in cell-only households are different from those in households with landlines. For example, adults living in cell-only households are much less likely to have health care insurance than those in households with landlines. Some demographic characteristics such as young age and minority race are associated with cell-only households. Since under coverage rate tends to vary by some demographic characteristics such as age in landline RDD surveys, there is increasing concern about

[2] Bloomberg, S., Ganesh, N., Luke, J., and Gonzales, G. (2013). Wireless Substitution: State-level Estimates from the National Health Interview Survey, 2012. http://www.cdc.gov/nchs/data/nhsr/nhsr070.pdf, last accessed on 12/18/2014.

the quality of estimates derived from them. For example, given the high prevalence of young adults in cell-only households, some observed decreases in the prevalence of certain health-risk behaviors may be the artifacts of young adult under coverage, and the estimates are subject to potential bias.[3] A cell phone sample was introduced in the MATS 2010 in response to this concern, and was continued in the MATS 2014. The goal is to improve the coverage of the Minnesota population, in particular those living in households without a landline.

Cell-Mostly Households

The cell phone frame was comprised of more than just cell-only households. A large proportion of the cell frame numbers are associated with households with a landline phone number as well. To sample and interview the persons living in the households with both landline and cell phone numbers through both sampling frames would result in oversampling this "dual-frame" population, and thus cause inefficiency in the design. However, previous research of the dual-frame persons indicated that the coverage and response propensity of such persons was differential by their landline and cell phone usage pattern. In particular, those who received most or all of the calls through their cell phone were shown to have higher coverage and response propensity through the cell frame than through the landline frame. Additionally, the literature also suggested the tendency of under-identification of young adults within "mixed-aged" households (those with both young adults and older adults) from landline RDD samples. It seemed plausible that the inclusion of cell-mostly households from the cell frame could potentially address these issues to some degree. It was felt that for this segment of the dual-frame persons, the relative coverage improvement outweighed the relative inefficiency of oversampling. For the remaining dual-frame segment, where most of the calls were not being received on the cell phone, a decision was made to drop them from the cell phone sample based on the information collected through the screening process.

Operationally, the MATS 2014 cell phone RDD screener asked questions about the use of both landline and cell phones. Then cell phone screener respondents whose

[3] Delnevo, C., Gundersen D.A., Hagman, B.T. (2008) Declining Estimated Prevalence of Alcohol Drinking and Smoking among Young Adults Nationally: Artifacts of Sample Undercoverage? Am. J. Epidemiol. (2008) 167 (1): 15-19.

households were cell-only or cell-mostly were included in the cell sample for extended interview. The cell phone users living in the households that were landline-mostly were dropped from the cell sample, although they still had a chance of being sampled through the landline frame. The persons living in the cell-mostly households can be sampled through both cell phone frame and landline frame. As discussed in Chapter 5, combining the landline and cell phone samples to produce a single final data file for estimates requires weighting adjustment that accounts for the dual probability of selection of any dual-frame cases. One goal of the weighting process is to reduce the sampling variance resulting from the complex sample design. The current design not only achieves the overall sample design efficiency, but also yields a large nominal number of cell-mostly interviews.

2.1.3 Geographic Stratification and Sample Allocation

The MATS 2014 used stratified sampling within the landline frame and cell phone frame. Differential sampling rates were applied to telephone numbers associated with different regions in Minnesota (i.e., counties grouped by geography). Table 2-1 shows the counties that comprise each region.

The goal was to yield regional samples that allow the analysts to better understand tobacco use, quitting, and second-hand smoke exposure at the regional level as well as the differences between regions. The MATS 2014 design aimed to improve regional estimates at the expense of modestly increased overall sample size while maintaining the precision of state-wide estimates. A "minimum allocation" approach was used to allocate a minimum proportion of the state sample to each geographic region. That is, regions whose sample sizes based on proportional allocation were lower than the minimum allocation received "help" from the regions whose proportional allocation was higher than the minimum allocation. An optimal allocation solution was chosen to benefit the comparison involving small regions without hurting the reliability of the state-level estimates too much. This resulted in a stratified design with at least eight percent of the sample allocated to each of the eight regions. The regional allocation does not affect the value of the state estimates because an appropriate weighting method was used to account for the effect of differential sampling.

Table 2-1. Geographic regions of Minnesota used for MATS 2014

Northeast	**Northwest**	**Central**	**West Central**
Aitkin Carlton Cook Itasca Koochiching Lake St. Louis	Becker Beltrami Clearwater Hubbard Kittson Lake of the Woods Mahnomen Marshall Norman Pennington Polk Red lake Roseau	Benton Cass Chisago Crow Wing Isanti Kanabec Mille Lacs Morrison Pine Sherburne Stearns Todd Wadena Wright	Clay Douglas Grant Otter Tail Pope Stevens Traverse Wilkin
Southwest	**South Central**	**Southeast**	**Twin Cities Metro**
Big Stone Chippewa Cottonwood Jackson Kandiyohi Lac Qui Parle Lincoln Lyon Murray Nobles Pipestone Redwood Renville Rock Swift Yellow Medicine	Blue Earth Brown Faribault LeSueur McLeod Martin Meeker Nicollet Sibley Waseca Watonwan	Dodge Fillmore Freeborn Goodhue Houston Mower Olmsted Rice Steele Wabasha Winona	Anoka Carver Dakota Hennepin Ramsey Scott Washington

Operationally, the cost of obtaining a completed cell phone interview is substantially greater than that of a landline interview. As in 2010, the MATS 2014 employed under-sampling of cell phone numbers in an effort to make the survey design more cost-efficient. At the same time, a higher proportion of the sample was allocated to the cell phone numbers in the MATS 2014 than in the MATS 2010. This is because telephone ownership and usage among the Minnesota population had changed significantly since the 2010 data collection. At the national level, the proportion of adult population living

in cell-only households had been increasing by about 2 percentage points annually, so a significantly higher proportion of the adults in Minnesota were expected to be in the cell-only households in 2014 than in 2010. Due to the growing cell-only and cell-mostly population and the changing cost function of RDD cell phone data collection compared to RDD landline data collection, a larger proportion of the sample was assigned to cell phone to make the survey design more cost-efficient. That is, the allocation was chosen as an optimum solution accounting for not only the estimated proportion of population in cell-only and cell-mostly households and the counterbalancing expectation of higher costs-per-case associated with cell frame completed interviews. An appropriate weighting approach was used to composite the cell phone sample and landline sample, so the change in sample allocation did not affect the comparability of the estimates between MATS 2010 and MATS 2014.

In summary, the MATS 2014 target sample size is 9,260, including 5,370 cases for the landline sample and 3,890 cases for the cell phone sample. This represents a 58 percent versus 42 percent allocation of the overall sample to the landline and cell phone frame respectively. Table 2-1 shows the target sample sizes by phone type and region. The MATS 2014 sample was a sufficiently efficient design that balanced the regional reliability needs and the state-wide design needs such that the required minimal detectable difference of 2 percentage points (based on one-tailed test with 80 percent power and 95 percent confidence level) between smoking prevalence rate estimates in 2010 and 2014 was achieved.

2.2 Landline RDD Sample

As discussed in Section 2.1.1, the MATS 2014 used a new landline RDD sampling frame that, according to the frame vendor MSG, included virtually all the active residential landline telephone numbers. This eliminated the concerns about under coverage of the phone numbers offered by cable and VoIP providers. Another new design component in the MATS 2014 was the stratification of the sampling frame by geographic region. The new landline RDD sampling frame was made of 1000-blocks, each of which consisted of 1000 consecutive telephone numbers. The frame vendor MSG was able to provide "coverage report" for each sampling region, showing all the 1000-blocks associated with the sampling region as well as the estimated proportion of the

telephone numbers in the 1000-block that overlaps the sampling region (i.e., "inclusion rate" of the 1000-block). Then each 1000-block was assigned to one and only one sampling region with which the 1000-block had the highest inclusion rate. Since in reality, the telephone numbers in most of the 1000-blocks are associated with one and only one sampling region, this assignment rule worked very well. Once the frame had been stratified, a random sample of phone numbers was selected from the blocks of phone numbers that contain at least one "assigned" phone number. No sample was selected from the 1000-blocks with no assigned numbers.

The screening eligibility criteria for the MATS 2014 are similar to those used in the MATS 2010. The cases eligible for MATS 2014 were defined as sampled phone numbers associated with a residence located in the state of Minnesota. Non-residential phone numbers or those associated with a residence outside of Minnesota were dropped as ineligible. Even though the sample frame was limited to Minnesota area codes/exchanges, it was possible for some numbers to be located out of state, due to some overlap at state borders or other circumstances in the assignment of phone numbers by telecommunications companies serving Minnesota residences.

The MATS 2014 sample design called for one adult at least 18 years old to be selected at random from each household that was identified through the RDD screening process. To select an adult from within a household, the Rizzo method[4] was used to select an adult from within a sampled household. As in the MATS 2010, nearly all of the initial refusal cases were subject to refusal conversion.

2.3 Cell Phone RDD Sample

The cell phone RDD design for the MATS 2014 called for a sample of randomly generated telephone numbers that were contained within the universe of telephone number classified as cell phone numbers. The cell phone frame stratification method was similar to that used for the landline frame, except that the assignment was based on the "rate centers" instead of 1000-blocks. Although most rate centers were associated

[4] Rizzo L., Brick J. M., Park I. (2004) A Minimally Intrusive Method for Sampling Persons in Random Digit Dial Surveys. Public Opinion Quarterly 68(2):267-274.

with one and only one sampling region, a few large rate centers actually crossed between sampling regions, and thus was split during the stratification process.

As with the landline sample, cell phone numbers not associated with a residence in the state of Minnesota were screened out. However, additional screening of the cell phone sample was required to identify those cell-only and cell-mostly households.

The cell sample design called for one adult to be selected at random from each household that was identified through the RDD screening process. While researchers hold different opinions on whether a cell phone is a person-level or household-level device, studies have shown that a non-negligible proportion of cell phone users share their phones with other household members, a non-rare phenomenon even among cell phone-only and cell-mostly households. So, in the MATS 2014, cell phones were treated as household devices as had been done in the MATS 2010. During the screener interview, the respondent was asked whether other household members shared the cell phone, and if the answer was yes, the Rizzo method was employed to conduct the within-household sampling before the extended interview. If the answer was no (no one else shared the phone), then the person answering the phone was by default the respondent, unless the phone user was under 18 years old and therefore ineligible for the survey. Further, it is common for minors to use cell phones, either their own personal phone that only they use or one that they share with other household members. If a minor answered a cell phone screener call, the MATS 2014 screening protocol determined if he or she was the sole user of the phone. If they were the sole user, the phone number was considered as ineligible for MATS 2014. If they shared the phone with other household members, the protocol determined whether any of these were age-eligible adults and, if so, sought to conduct the screening interview with an adult household member (since minors are not eligible to serve as RDD screener respondents).

For both the landline sample and cell phone sample, the entire sample was partitioned into multiple release groups within each sampling stratum, each release group being a random subsample of the entire sample. Release groups allow for the controlled, random release of the sampled phone numbers, so that yields of completed interviews can be closely monitored and additional samples released as needed to achieve the

desired number of completed interviews, once the yield patterns become established. After an initial set of release groups was assigned to the MATS 2014 interviewing operation, additional groups were released, as needed, to reach the sample yield goal overall and by stratum.

Table 2-1 includes the target sample sizes and actual yields by geographic region (according to the respondent self-reported information) for the MATS 2014 landline RDD sample, cell phone RDD sample, and overall. Although the self-reported region may not necessarily be the same as the sampling region (i.e., sampling stratum), the latter is a very good predictor of the former, with consistency rates ranging from 94 percent to 98 percent for the eight regions in the landline sample and 76 percent to 86 percent for the eight regions in the cell phone sample.

Table 2-1. Target and actual sample sizes in the MATS 2014

Geographic region (according to respondent self-reported information)	Target sample size			Actual sample yield		
	Landline	Cell phone	Overall	Landline	Cell phone	Overall
Central	621	449	1070	607	471	1,078
Metropolitan	2,123	1,537	3660	1,974	1,682	3,656
Northeast	429	311	740	447	300	747
Northwest	429	311	740	459	285	744
South Central	429	311	740	416	345	761
Southeast	476	344	820	508	309	817
Southwest	429	311	740	430	317	747
West Central	429	311	740	459	295	754
Overall	5,365	3,885	9250	5,300	4,004	9,304

3. Data Collection Methodology

3.1 Questionnaire Development

MATS 2014 required developing two questionnaires. The main questionnaire was the substantive survey instrument containing all of the questions for the MATS 2014 interview. In addition, MATS 2014 needed a household screening questionnaire, some form of which is used in every RDD survey to identify households and then identify and sample people within the households. For brevity, the household screening questionnaire is generally referred to as the "screener" and the MATS 2014 main substantive questionnaire as the "extended" questionnaire. The same extended questionnaire was used for both the landline and cell phone samples (except for a few questions about cell phone ownership and use that were only asked of landline respondents). The screener for the cell phone sample required some questions not contained in the landline sample screener because cell phone respondents were only eligible to complete the extended interview if they received most or all of their calls on their cell phone.

3.1.1 MATS 2014 Questionnaire

ClearWay Minnesota and MDH began the process of designing the MATS 2014 instrument in the summer of 2013 by reviewing the MATS 2010 instrument and proposing items to be added, eliminated or reworded. Applying an iterative, consensus approach, ClearWay Minnesota and MDH worked through various versions, adding items to address new research questions or provide further information about previous research questions. The proposed changes reflected the current research agenda of MATS 2014, the experience with the utility of MATS 2010 data, the need to eliminate some items to accommodate new items, and the desire to somewhat reduce the overall length of the interview. The final decision to eliminate a question or panel of questions usually reflected a general consensus that the eliminated items were of interest in the past but not in the present, or were of lesser importance, given the need to obtain different information in MATS 2014. Westat began working with ClearWay Minnesota and MDH to refine and finalize the design of the questionnaire in September 2013.

While some items remained to be added or eliminated in mutual discussions, Westat focused on working with ClearWay Minnesota and MDH representatives on question wording, response category selection and wording, question flow and ordering, and optimizing the design for telephone interviewing.

As noted in Section 1.1, maintaining continuity with the previous MATS surveys was a critical objective. However, changes in questionnaire design are desirable or unavoidable in large-scale surveys repeated over long time periods, due to the emergence of new issues or phenomena in regard to tobacco control, epidemiology, treatment, and education; scientific advances; altered focus on the part of the researchers, administrators, and practitioners who use the time series data; and the impacts of real world occurrences, such as political forces, actions of the tobacco industry, funding limitations, or social factors. Maintaining continuity in the MATS 2014 questionnaire was a balancing act between absolute conformity and making desired or necessary improvements.

Examples of substantial changes made in the MATS 2014 instrument include the elimination of questions about:

- Alcohol use
- Use of smokeless tobacco as an alternative to cigarette smoking
- Awareness of stop-smoking programs
- Use of individual nicotine replacement products for quitting (though a single question about these products in general was retained)
- Use of specific programs and services for quitting (though a single question about programs and services in general was retained)
- Plans to quit (in next 6 months or 30 days and likelihood of success)
- Possible use of quitting resources disregarding cost
- Working status, job characteristics, and workplace smoking policies
- Effect of restrictions on quitting or cutting down

- Questions about health insurance
- Questions about diagnoses of anxiety or depression
- Perceived financial status
- Number of children in the household by age range (replaced with a single yes/no question asking whether there are any children under 18)
- Questions about second-hand smoke policies and opinions (such as the smoking ban in bars and restaurants)

Major additions to the MATS 2014 instrument allow exploration of new research questions about:

- Cigarette purchasing behaviors (cost, unit of purchase, cost saving strategies)
- Plans if menthol cigarettes were no longer sold (quit, other alternatives)
- E-cigarette use (ever used, how many times in past 30 days, reasons for use, use of flavors, regular flavor)
- Quitting timeline (smoking behavior 12 months ago, date of last quit attempt, duration of last quit attempt)
- Frequency of discussions with medical provider (medication and other resources)
- Smoking policy in vehicles
- Duration of exposure to secondhand smoke
- Perceived harm of brief exposure to secondhand smoke
- Exposure to smoke within apartments or other shared-wall buildings
- Questions asking about respondents' willingness to participate in follow-up research and collecting contact information

The final MATS 2014 questionnaire appears as Appendix A of this report. In addition to developing this interview script format of the questionnaire during the design process,

Westat also developed a detailed table cross-walking and documenting every question or response category added, deleted, or changed from MATS 2010 to MATS 2014, along with an assessment of its possible impact on data comparability between MATS 2010 and MATS 2014. This table is incorporated in the Minnesota Adult Tobacco Survey 2014 Comparability Report, which provided further details of the changes and additions that resulted in the MATS 2014 questionnaire.

The final MATS 2014 questionnaire covered domains such as general physical health, cigarette smoking and other tobacco use, smoking cessation, experience with health care provider smoking interventions, attitudes towards smoking, exposure to secondhand smoke in various settings, the effects of public and private policies and rules on smoking behaviors and perceptions, and demographic information.

Westat developed detailed specifications to program the MATS 2014 questionnaire as a CATI survey instrument. The programming specifications are embedded in the MATS 2014 instrument included as Appendix A.

3.1.2 MATS 2014 RDD Household Screeners

Appendix B contains the MATS 2014 RDD landline household screener instrument and Appendix C contains the RDD cell phone screener instrument. The landline screener was a standard RDD screener, as adapted by Westat to implement the Rizzo method for RDD respondent selection. The cell phone screener also used the Rizzo method when necessary (i.e., when the cell phone number was used by more than one person to receive calls). The cell phone screener also incorporated various questions needed to determine sampling eligibility as described above in Section 2.2 and to select the respondent for the interview. These included questions to:

- Confirm that the phone number is a cell phone number;
- Confirm the cell phone number belongs to a Minnesota resident;
- Exclude cell phone numbers used exclusively by minors;
- Determine the owner or primary user of the cell phone;

- Determine the degree to which the household receives its calls by landline, cell, or both; and
- Determine which adults in the household receive calls on the sampled cell phone number.

3.1.3 CATI Questionnaire Programming and Testing

Programming of the CATI questionnaire was carried out by Westat's CATI programming team, led by a senior CATI systems analyst. Testing of the programmed instrument was performed by the programmers, by an independent testing department at Westat, and by questionnaire designers from Westat. The several levels of testing revealed a few items that required correction and a few items that resulted in minor changes to the instrument design and specification.

3.2 Pilot Test

3.2.1 Background

Between February 3 and February 9, 2014, Westat conducted a pilot test of the RDD survey, including the MATS 2014 questionnaire, the landline and cell phone screeners, the within-household sampling procedures, the interviewer scripts and telephone contact procedures, and the handling of the cases in the CATI system's automated scheduling and case management system. The pilot test objectives were live field testing of the:

1. Programming of the CATI questionnaires;
2. MATS 2014 questionnaire's suitability for administration by interviewers;
3. Respondents' comprehension of the questions and their ability to provide answers; and
4. Screening questionnaires, screening rules and procedures, and respondent selection.

3.2.2 Pilot Test Operations

The pilot test had a goal of 100 completed interviews, 70 from the landline sample and 30 from the cell sample. An initial sample of 857 landline numbers and 1,171 cell phone

numbers was assigned to data collection and Westat completed 116 interviews – 64 from the landline sample and 52 from the cell sample. The pilot data collection employed substantially all of the data collection procedures to be implemented in the full survey, with two planned exceptions. Because the data collection period of the pilot test was brief and the primary objective was to test the instrument, the pilot test purposely did not carry out the refusal conversion protocol for either the household screener or the extended interview, as planned for the full survey. The pilot test sample also did not receive any of the supporting letters (non-contact letter and refusal conversion letter) that the actual survey sample received (see Section 3.4.1 for a full description of these letters).

3.2.3 Pilot Test Interview Monitoring and Interviewer Debriefing

During the pilot test, Westat's telephone supervisory staff conducted live monitoring of the interviews. Monitors could hear both sides of the conversations and see on their computer screens a live, mirrored version of the interviewer's actual CATI screen. During regular survey operations, the monitoring is conducted as a quality assurance measure of the interviewer's following of the data collection protocols, correct reading of the questionnaire text, handling of questions and problems, and entry of responses. Since experienced interviewers were assigned to the pilot test, the monitors were able to focus on the aspects of the data collection design that were being subject to testing: whether the procedures worked as planned, whether the questionnaire wording and flow supported clear administration by the interviewers, and whether the respondents had any general difficulties in understanding the questions or formulating an answer. The monitoring produced no reports of general problems along these lines. Interviewers were able to handle questions that some respondents asked about the survey or specific questions, based on their training and using the set of Frequently Asked Questions developed for them by the survey managers.

When the interviews were completed, Westat's telephone operations manager, two MATS 2014 project managers, and members from ClearWay Minnesota and MDH held a focused one-hour debriefing session with 10 data collectors and 2 supervisors. The debriefing session was conducted via conference call. It consisted of a discussion in response to a list of questions about the interview designed to elicit both respondent

and data collectors' reactions to the questionnaire design and the interviewing experience. The questions were both general and structured and focused on specific questions that were new to the instrument.

The data collection staff were positive about the questionnaire in terms of their ability to administer it clearly and of respondents' ability to provide answers to the questions with little difficulty. Data collectors reported some challenges gaining cooperation, especially among the cell phone sample. The pilot test revealed no significant problems with questions new to MATS 2014. Some minor wording changes were made to a few questions to make them clearer to the respondents or to assist them in providing answers consistent with the intent of the question. Some Pilot respondents who reported smoking said that they did not buy their own cigarettes, prompting the addition of a new response choice to question D15 (asking where the respondent usually buys cigarettes) indicating that the respondent did not purchase cigarettes in the past 30 days. This new response skipped several additional questions about shopping-related behavior.

The statisticians examined the various yields of the pilot test, to the extent that they were predictive of yields in the full study. The pilot test was not designed to predict yields, given the unknown effect of deliberate pilot test plans, such as stopping the test when the desired number of completed interviews was reached, not using the full study mailing protocol, and not implementing refusal conversion (see Sections 3.4.1 and 3.6.2 below). While information about sample performance was very limited, completing the target number of completes for the Pilot required more time and effort than planned and even with additional time and effort, Westat fell slightly short of the goal for landline completes. While limited, the performance of the Pilot sample gave indications that sample yield rates could be lower than were assumed based on MATS 2010 results.

The pilot interview length timings averaged just under 15 minutes though the target length was a 20% reduction from the 15-minute length of MATS 2010 (i.e. 12 minutes). Because of the desire to include all of the Pilot questions in the main study, the Advisory Board chose not to cut questions from the survey with the understanding that this approach might require additional resources and/or scope adjustments. The MATS 2014 pilot test revealed that the design of the MATS 2014 questionnaire successfully

achieved its objectives, in terms of obtaining the desired information, being clear and minimally burdensome to respondents, and readily administered by interviewers. The live test also confirmed that the CATI instrument performed correctly as to flow and data capture, as intended by the design and as previously verified by beta testing. Perhaps most importantly, the test showed that the overall design of MATS 2014 – interviewer training, calling procedures, the RDD screening, explaining the purpose of MATS 2014, identifying and obtaining cooperation from selected individuals, and successfully taking them through the MATS 2014 questionnaire – was feasible in a real world setting. The results of the pilot test are described more fully in the Minnesota Adult Tobacco Survey 2014 Pilot Test Report[5] (Westat, 2014).

3.3 Interviewer Recruitment and Training

Westat assigned interviewers from its current staff of interviewers and recruited additional staff as needed to supplement current staff. The additional staff were located either in call centers or worked from their homes. All interviewers received two waves of training: general interviewer training and MATS-specific training. (Current Westat interviewers had previously received the general interviewer training; newly recruited interviewers received both). The general interviewer training was self-paced and self-administered, with the interviewers working though Web-based self-study modules. Before an interviewer could progress to the next module, he/she had to pass an assessment on the module just completed, with a 100 percent correct score. Interviewers could review content until they were able to attain 100 percent correct on all assessments.

The general interviewer training (GIT) modules covered topics such as:

- The concept of data and social science research, and the role of the interviewer in this research process
- Principles and tenets of standardized interviewing and the use of the CATI system

[5] Readers interested in more information about this report may contact Ann St. Claire, ClearWay Minnesota, at (952) 767-1416 or astclaire@clearwaymn.org.

- Concept of a scientific sample and the importance of probability sampling; the various ways data can be collected: in-person, telephone, Web, observation, medical measurement, etc.
- Survey design, administration, and respondent contact procedures
- Standard call disposition codes
- Importance of interviewer neutrality, verbatim question delivery, and exact recording of responses as central to standardized interviewing
- Projecting professionalism and expert knowledge of the survey as key characteristics in securing respondent cooperation
- Listening skills and speaking skills
- Voluntary nature of survey participation, informed consent, and confidentiality

Training in use of the CATI system employed an interactive, self-administered, computer-based tutorial. Each interviewer moved through a series of topics, such as instruction on logging onto the CATI system, using the keyboard, the mouse, and special CATI commands. At this point interviewers learned the keys and commands for entering data and handling situations outside of the automated flow of the CATI questionnaire. Also included in this session was practice in the coding of contact results. Trainees experienced recorded replications of common contact situations and learned the proper coding techniques through presentation and practice. A follow-up test was administered to evaluate mastery of the contact procedures. The interviewers who were considered for the MATS assignment and to receive the MATS-specific training were limited to those who achieved a perfect score (100 percent) on this test.

The first stage of MATS-specific training was conducted in the same way as the general interviewer training, including the requirement to score 100 percent correct on each module's evaluation assessment before proceeding to the next training module. The self-administered portion of the MATS 2014 project training focused on the background of the study and an introduction to the screener and extended questionnaires. Following the self-administered training modules, interviewers attended a live, web-based training session with a live trainer. The trainer reinforced concepts learned

through the self-paced trainings, moving through practice versions of the questionnaire and allowing the trainees to practice administering the questionnaire. Specific topics included:

- MATS questionnaire items and the flow of the MATS questionnaire, including terms and definitions
- RDD screening process
- Contact scripts
- Handling of problem situations and the use of the prepared, standard responses to frequently asked questions

Training instructors and team leaders were available to assist interviewers should they encounter difficulty with a particular training concept or module. MATS trainers communicated with interviewers through instant messaging, training-based electronic bulletin boards, email, and telephone calls. After interviewers completed all of their training modules including the live web-based session, they were teamed with a partner to conduct practice interviews with each other (role plays). During the role play sessions each interviewer was monitored and coached to assess and enhance their interviewing skills. Once the supervisor determined the interviewer demonstrated the appropriate command of the interview and study materials, the interviewer was permitted to conduct actual MATS interviews.

3.4 Communications with Sample Members

There were a variety of methods used to communicate with the MATS 2014 sample during data collection. These included a variety of letters, an informational website, and several contact numbers that potential respondents could call for information or other purposes. These tools were designed to improve response rates and provide information to sample members or to the general public about the survey.

3.4.1 Letters

MATS 2014 developed two different letters sent to members of the RDD landline sample. These were a non-contact letter and a refusal conversion letter. While MATS

2010 used advance letters, the use of advance letters was not considered cost-effective for MATS 2014. All letters were printed and mailed using letterhead of the Minnesota Department of Health and signed by the Director of the MDH Division of Health Policy. Because it is not possible to reverse match cell phone numbers to addresses, MATS 2014 did not implement any mailings for the cell phone sample and only sent letters to landline sample records where a matched address was available.

- The **non-contact letter** was mailed when, after repeated calls to an RDD landline number, no contact had been made that would allow determination of whether or not the phone number belonged to a residence. The non-contact letter was designed to get through to people who may have been screening calls through Caller ID, who may have had a phone line to which no phone was connected, or similar reason why contact could not be made. The letter stressed the importance and legitimacy of the survey and urged the recipient to respond to calls from Westat or to call Westat's toll-free number.

- The **refusal conversion** letter was mailed when a phone number had been established as belonging to a household but the members refused to participate in the household screening interview. The refusal conversion letter was designed to persuade the household to participate in the screening and then in the extended interview. It contained much of the information included in the advance letter, with additional emphasis on the importance of the recipient's participation.

Copies of these letters appear in Appendix D.

3.4.2 MATS 2014 Informational Website

The MATS 2014 Advisory Panel and Westat web designers developed an informational website to provide sample members and potential respondents with a set of brief, simple, and clear informational points about the survey. Its purpose was to encourage participation among selected respondents, enhance the perceived legitimacy of the survey, and answer questions potential participants might have. Legitimacy was enhanced by the visibility of the web page on the Minnesota Department of Health's official website, at http://www.health.state.mn.us/2014healthstudy.

The main web page provided a brief overview of the survey with menu links to four subpages covering the topics:

- How participants are selected
- How the survey works
- Frequently asked questions
- Sponsoring agencies and contact information

In the letters and web pages, MATS was characterized as a health study with an emphasis on tobacco rather than exclusively as a tobacco survey. This was designed to avert non-smokers from a disinclination to participate due to a perceived lack of relevance to them and to mitigate smokers' possible perceptions of persistent focus on them by media, government, and the health care community.

The contents of the MATS 2014 informational website appear in Appendix E.

3.4.3 Toll-free Numbers and Contacts Provided by Westat and the Minnesota Department of Health

Westat operated a toll-free number that MATS 2014 sample members could call to obtain information about the survey. Westat's inbound call center answered the toll-free line and either responded with the requested information or referred the caller to an assigned contact person at MDH. MDH provided the name and direct line of a contact person. These numbers and contacts were printed in the appropriate letters, were available on the website, and were provided upon request by the telephone interviewers.

3.5 Data Collection Confidentiality Procedures and Protection of Human Subjects

All Westat staff are bound by strict confidentiality and privacy rules and procedures that are designed to prevent deliberate or inadvertent disclosure of the identity or survey data of anyone belonging to a data collection sample. All Westat staff are trained in the relevant protocols, covering oral, electronic, or printed disclosure, and in the

techniques to safeguard such information in all of these forms. As a condition of employment, they are required to sign a pledge of confidentiality laying out these requirements. They undergo required annual training on human subjects protection and information security.

These general rules and procedures apply equally to center-based and home-based interviewers; home-based interviewers are subject to further requirements, in terms of working from a segregated office space within their home environment and outside of the presence of anyone else in the household. Using the web-based interface, all data collected by the home-based interviewers were entered in real time into the central survey database maintained within Westat's physical facility and behind Westat's software firewall. Sample identifying information, questionnaire text, and response data were only visible on the interviewers' screens; no data could be copied or saved electronically or printed locally.

All sample and survey data were maintained on Westat's secure, password protected network, with access to MATS-related data limited to staff approved to work on MATS 2014.

The MATS 2014 survey questionnaire, data collection, and data security plan were reviewed and approved by the Westat Institutional Review Board (IRB) and the Minnesota Department of Health Institutional Review Board.

Westat's general confidentiality procedures are designed to comply with applicable requirements of state and federal law relating to Protected Health Information (PHI), including the Health Insurance Portability and Accountability Act of 1996 (HIPAA). PHI and HIPAA apply to health information contained in health records; collected survey data are covered by other federal statutes and is subject to the oversight of the Office of Protection from Research Risks.

3.6 Data Collection Operations

Data collection occurred between February 17, 2014 and July 10, 2014. Calling took place from 9 AM to 9 PM weekdays, 10 AM to 6 PM Saturdays, and 2 PM to 9 PM Sundays (all times Central time). Consistent with standard operational practice for

personal telephone interviews of individuals in their homes, the majority of calls occurred between 6 PM and 9 PM weekdays and throughout the weekends, in order to optimize the amount of effort applied when people are most likely to be found at home.

3.6.1 Calling Procedures

3.6.1.1 General Case Handling and Contact Procedures

MATS 2014 telephone procedures applied a hierarchical approach to case management. This includes making cases available for call attempts based on the current status of the call. Those cases for which an exact appointment was scheduled had the highest priority, followed by those with a general call back time (e.g., information that "evenings are best" to reach the desired person), those that had been called previously without human contact and lastly cases that had never been called. To optimize the balance between contact likelihood and overall efficiency, at least 7 call attempts were made to each sampled number, unless the number needed fewer attempts to reach a natural final disposition. Some cases released late in the data collection period to meet regional targets did not receive the full protocol. Until contact was established, the CATI scheduling system automatically spread out the calls across various times of day and various days, including weekdays and weekend days.

As described in section 3.6.2, a second effort was made to convert refusals to the RDD household screener or to the extended interview, except for those few characterized as "hostile" refusals.

3.6.1.2 Supplemental Calling Procedures

Once data collection was in progress, MATS 2014 implemented several measures designed to improve response rates and increase the number of completed interviews obtained from the released sample. The most significant of these was the decision to re-activate cases that had been coded as final non-response because they had reached the maximum number of call attempts according the calling protocol.

In order not to badger households, the MATS calling protocol allowed for only one answering machine message to be left at a phone number prior to the point when live contact was made. Towards the end of data collection, a second answering machine message was left at any phone number where live contact still had not been made.

3.6.1.3 Calling Rules Determined by Special Case Eligibility Rules

In the previous round of MATS, two issues emerged that required the MATS 2010 design team to develop handling rules that were consistent with the study's research objectives, statistical sampling practices, and data collection operational procedures. Their common feature was temporary residence out of state. For MATS 2014, Westat used the procedures as refined and finalized for MATS 2010.

3.6.1.3.1 Snowbirds

The protocol for handling "snowbirds," residents who leave the state for warmer climates in the winter, for MATS 2014 was to consider them as valid Minnesota residents on an extended vacation. They were, therefore, eligible members of the sample, and MATS 2014 sought to interview them. However, because some MATS 2014 research questions address social and environmental factors and Minnesota policies and programs, the survey designers concluded that it was best to interview people only when they were physically within the state borders. If snowbirds currently dwelling out of state were identified during initial calls, arrangements were made to interview them upon their return to Minnesota, if they returned before the end of the data collection period. If they were not in the state during this period, they were not followed to their winter residence for an interview. Since they remained as eligible members of the sample, the latter group was classified as a form of survey non-response, rather than as ineligibles who could be dropped from the sample for response rate calculations and sample weighting.

3.6.1.3.2 College Students Living Away from Home

A common protocol for RDD surveys (based on fairly complex rules that the U.S. Census uses to define household membership) is that students who reside away from home are considered members of the household if they live in group quarters (such as a dormitory) but not if they reside in private or small common residential units (generally defined as those occupied by nine or fewer unrelated individuals).

The research issues that arose in regard to snowbirds similarly applied to the out-of-home student situation, and MATS slightly modified the commonly applied RDD rules for students.

Young adults who were found to be attending college in Minnesota were eligible to be interviewed, even if they were not currently residing in the household at the phone number of record (most likely their parents' house). The procedure was to call them at any phone number where they could be reached to conduct the interview, including calling back at the number of record if they would be available there before the end of data collection.

Young adults who were found to be attending college outside of Minnesota were classified as not eligible for the study, because they would be less exposed to the social and environmental factors and Minnesota policies and programs that were a focus of MATS 2014. They were dropped from the sample for response rate calculations and sample weighting.

The RDD screening protocol did not seek to explicitly identify students. The protocol was applied only in the situation where a student's status as residing temporarily away from home was offered by the adult who completed the household enumeration in the MATS 2014 screener. If this happened, the interviewer was instructed to ask if the student was attending school in state or out of state. If out of state, the interviewer recorded the case as a special problem with detailed comments for review by supervisory staff. If the supervisor concurred with the determination, the case was coded as ineligible; if not, it was reactivated with instructions to continue to pursue the interview with the student wherever he or she could be reached.

3.6.2 Refusal Conversion

In scientific surveys, it is standard practice to recontact people who initially refuse to participate in an interview, in a second attempt to persuade them to participate. This refusal conversion process is designed to increase the sample size and response rate, and also to reduce bias associated with including in the sample only those who are most inclined to respond, i.e., those who respond immediately to the participation request. This section describes the MATS 2014 refusal conversion process for the RDD screeners and extended interviews. See Section 4.4.2. for the quantitative results of these refusal conversion efforts.

When interviewers encountered reluctant respondents, they first attempted to avoid the refusal by addressing any concerns expressed. When that attempt was unsuccessful, the interviewer coded the case a refusal and completed a non-interview report form. Included in this form was a brief description of the reason for and the strength of the refusal. The strength of the refusal was coded mild, firm or hostile. Mild and firm refusals were mostly determined at the discretion of the interviewer. Typically refusals were designated mild if the respondent hung up without explanation and firm if some type of reasoned explanation was provided. The hostile designation was reserved for respondents who used vulgar language or were threatening.

Each refusal case was withheld from additional call attempts for a cooling off period of at least 13 days (except during the final weeks of the field period where this cooling off period was abbreviated). After this cooling off period, specially trained interviewers attempted to recontact the phone number (for screener refusals) or the selected adult (for the extended interview), to persuade them to participate in the survey. If the respondent refused a second time, the case was finalized as a refusal and no further attempts were made to contact them. The interviewers selected for these conversion attempts demonstrated an above-average comprehension of the study objectives and ability to share this knowledge with the respondent. They received additional training to aid them in dealing with challenging situations.

3.7 Data Quality Assurance

Data quality assurance for MATS 2014 took a variety of forms prior to, during, and following data collection. Prior to data collection, data quality assurance was addressed through the questionnaire design, specification, and testing process described elsewhere. The valid generalizability of the collected data to the overall population was further assured by a well-designed and scientifically drawn sample. The techniques for designing and drawing the sample are described throughout Chapter 2.

The present section addresses measures implemented to assure the quality of the data as collected during and following data collection. Such measures include monitoring interviewers and providing feedback to them, review of the actual data captured in the CATI system during data collection, ongoing monitoring of sample performance during

data collection, and in the processing of the data into the final database once data collection is ended.

3.7.1 Interviewer Monitoring

Westat uses a silent monitoring system that allows supervisors to listen on the phone and to watch interviews on the CATI screen in real time without the interviewer or respondent knowing that they are being observed. Monitoring reports are completed for each monitoring session and reviewed with the interviewer during each shift. This provided the opportunity to reinforce good skills and coach interviewers in areas needing improvement in a timely manner. Approximately 10 percent of all interview time was monitored.

3.7.2 Data Cleaning and Editing During Data Collection

The primary method for assuring the quality of the collected data is to address this objective, before the fact, in the design and programming of the CATI questionnaire, in the data collection protocol developed, and in the training of the interviewers in general best practices and the specifics of the MATS 2014 questionnaire and interviewing protocol. All of Chapter 3 up to this point has addressed these issues in detail.

Even though the CATI system controls all skip patterns and allows only valid ranges of values to be entered by the interviewers, Westat data managers conducted additional reviews of the collected data after the fact.

The first review consisted of initial review of the frequency distributions of every survey variable during the data collection process. The CATI data manager reviewed the frequencies for each variable to check for any inconsistencies in the skip patterns or range violations. While rare in a well-tested CATI system, such errors may occur because of unusual situations not anticipated in the design or not revealed during testing. Such quality assurance allows discovering any such problems early in the process, making necessary corrections, and recalling affected respondents to obtain corrected data (data retrieval). This process did not reveal any errors in the CATI questionnaire programming for MATS 2014. Throughout the data collection process, the CATI data manager also reviewed comments noted by the interviewers in the CATI system. These comments might have been notes made by the interviewers themselves,

or might have been extraneous comments made by the respondents and recorded by the interviewers. Often the comments required no further action. In some instances, the comment could be an indication that the respondent corrected their answer to a previous question, or the interviewer was unsure how to code a particular response. In these cases, the CATI data manager made any necessary edits to the data or referred the case to a MATS data collection manager for a decision. Any such edits were documented in the data edit log, which contains both the original value that was recorded in the interview as well as the new, updated value for each respective variable where an edit occurred, along with a brief description detailing the reason for the edit.

3.7.3 Data Cleaning and Editing Following Data Collection

After data collection was completed, the MATS 2014 data delivery manager developed a SAS program that independently tested the data integrity rules and ascertained the follow through of all skip patterns. This SAS program served as a second layer of quality control to ensure the accuracy of the data integrity rules specified for the instrument. The program produced a detailed, case-by-case, variable-by-variable report if any errors were encountered. Errors in this context refer to instances where data were either missing, or data were present where they should not have been. The data manager reviewed the error report and made any necessary corrections to the data to accurately satisfy the data integrity rules of the instrument. The data delivery manager also rechecked each variable for values outside of the allowed ranges. All edits made to the dataset were documented in the same data edit log that was used for edits made by the CATI data manager during data collection.

3.7.3.1 Post-coding of Verbatim Text in 'Other-Specify' Questions

Once the data were cleaned, additional processing of the data occurred as a result of reviewing and recoding the text responses to the various open-ended 'Other-Specify' questions that appear in the MATS 2014 questionnaire. ClearWay Minnesota and MDH approved post-coding and recoding decisions made by Westat, most of which were similar to decisions made in MATS 2010 . In addition to creating post-codes for the 'Other-Specify' responses, this process also identified some instances where a categorical response to an earlier question in the same sequence as a given 'Other-

Specify' question should be recoded, based on the additional information that the respondent furnished in the 'Other-Specify' response.

All updates made to the data as a result of this process were stored in the final dataset in newly created variables, and the data as originally collected were preserved in historical variables in the dataset. Westat documented the process in a review and recoding protocol document; a database at the record and variable level that recorded all 'Other-Specify' text responses, post-codes, and recodes.

3.7.4 Sample Performance Monitoring During Data Collection

Throughout the data collection process, it was vital to monitor several outcomes of the data collection process, mainly to project estimated final totals from interim results and determine what adjustments were needed or possible, in order to support achieving the targeted number of completed interviews for each region. Aside from standard weekly reports of case dispositions for the sample, there were two areas of particular interest to the survey sponsors and Westat technical managers.

1. From a sample management perspective, it was necessary to monitor the overall yield of completed interviews resulting from the sample release groups activated at the outset and then in subsequent releases, to assure achieving the target number of completed interviews.

2. Because of the sample design targeting a minimum number of completed interviews from each of the 8 regions, sample performance monitoring focused on yield rates by phone type (landline or cell) and by both sample region and reported region. While about 95% of landline respondents reported living in the region in which they were sampled, this was the case for only about 83% of cell phone respondents.

3.7.4.1 Monitoring the Overall Number of Interviews

It is standard practice in survey research to initially not release all of the originally projected number of sample release groups, and then monitor sample performance to determine if more sample is needed. In response to trends and patterns in sample performance identified through the monitoring process, the statisticians and operations managers updated the projections at several points during data collection to determine

if the release of additional sample was warranted. Chapter 4 contains additional details about sample sizes.

The landline sample screener and extended response rates were considerably lower than the rates expected based on MATS 2010 results and adjusted for the estimated decline in RDD response rates from 2010 to 2014. Also, yield rates for both landline and cell sample varied considerably across sampled region. Westat initially ordered 150% of the sample thought to be needed for each region. However, the lower response rates, differential yield rates by region, and unbalanced regional "migration" (respondents reporting living in a region different from where they were sampled) required an additional round of sampling beyond this 150% for several regions. Ultimately, Westat was able to get at least 99% of the total target completes for each region.

3.7.4.2 Monitoring Smoking Prevalence Rates

Smoking prevalence rates were monitored throughout data collection, and particularly at the point when the completed sample size was large enough to make the interim calculated rate predictive of the final estimates. There were no indications of any problems or issues based on the review of unweighted counts and proportions of respondents indicating their smoking status. The MATS 2014 unweighted proportions from the landline sample were reasonable based on estimates from MATS 2010. This was true overall and by the two monitored age groups: 18-24 and 25+. In addition, comparisons were made between the landline and cell phone unweighted smoking status proportions. The observed relationships were all within expectations.

4. Data Collection Results

Chapter 4 presents various statistics summarizing the outcomes of the MATS 2014 data collection, separately for the landline and cell phone samples and for the combined sample. The key statistics presented are the call dispositions and the response rates for these two sample groups.

4.1 Completed interviews

Table 4-1 presents the overall number of completed interviews for the landline and cell phone samples.

Table 4-1. MATS 2014 completed interviews, by sample type

	Landline	Cell	Total
Completed interviews	5,300	4,004	9,304

4.2 Telephone Interviewing Results

4.2.1 Landline Sample Call Dispositions

Tables 4-2 and 4-3 show the detailed dispositions for all of the sampled landline telephone numbers that were released to data collection. Table 4-2 shows the dispositions for the screening of the 119,370 sampled landline numbers; Table 4-3 shows the dispositions of the 7,820 numbers for which a household screener was completed and from which an adult was selected for the MATS 2014 interview. These tables tabulate the actual disposition categories that Westat employed to manage the sample for the MATS 2014 interviewing operations. They also show the standard AAPOR disposition codes to which each lower-level MATS 2014 disposition category is mapped. (AAPOR is the American Association for Public Opinion Research, to which many survey researchers belong and whose members have established various standards for scientific survey research that are widely accepted.)

Table 4-2. MATS 2014 landline telephone number sample dispositions

AAPOR code	Description	Count	Percent (%)
N/A	Completed eligible screener	7,820	6.55
4.70	There is no one in the household age 18 or older to do the screener.	45	0.04
4.10	The sampled telephone number rings into a household not located in Minnesota.	136	0.11
2.35	All household members are currently living out of state and will not be back before the end of data collection ("Snowbirds").	0	0.00
2.36	Sampled telephone number is part of MATS Cohort Study.	0	0.00
2.36	Only eligible household member already completed study on another phone number.	1	0.00
4.10	Other out of scope – The case is out of scope and no other final code applies.	0	0.00
2.331	Language Problem: unable to communicate due to a hearing or speech problem or unable to reach an English speaking household member.	179	0.15
2.20	The maximum calling algorithm has been fulfilled. At least one "human" contact has been made at the number and there are no refusals or language problems in the call history for the household.	737	0.62
3.13	The calling algorithm has been fulfilled with no "human" or answering machine contact.	6,954	5.83
4.50	The telephone number was identified as non-residential during business purge preprocessing prior to CATI load.	5,036	4.22
3.14	The maximum calling algorithm has been fulfilled for a telephone number and only answering machine contact was made.	4,344	3.64
4.50	The telephone number called was not a residential number. Included are businesses, institutions, agencies, modems, public facilities, vacation homes, group quarters.	3,957	3.31
4.30	The telephone number was identified as non-working during Tri-tone match processing prior to start of calling.	71,903	60.24
4.30	The telephone number was found to be not working when called.	9,434	7.90

Table 4-2. MATS 2014 landline telephone number sample dispositions (continued)

AAPOR code	Description	Count	Percent (%)
4.30	The telephone number resulted in no ring-back during purge processing prior to CATI load.	1985	1.66
2.111	Refusal – Household screener respondent refused to be interviewed or broke off during the screener interview.	6,776	5.68
2.111	Refusal – Screener refusal results from a call to the Minnesota Department of Health or the study's toll-free line.	63	0.05
	Total	**119,370**	**100.00%**

Table 4-3. MATS 2014 landline extended interview sample dispositions

AAPOR code	Description	Count	Percent (%)
1.1	Completed interview.	5,300	67.77
4.10	Subject does not live in the state of Minnesota.	1	0.01
2.35	Subject is currently living out of state and will not be back before the end of data collection ("Snowbirds").	0	0.00
4.10	Subject is currently attending school out of state and will not be back before the end of data collection.	0	0.00
2.332	Language Problem: unable to communicate due to a hearing or speech problem or the selected respondent was unable to speak English.	57	0.73
2.20	The maximum calling algorithm has been fulfilled. At least one "human" contact has been made at the number.	699	8.94
2.31	Non-Response: subject deceased.	0	0.00
2.22	The maximum calling algorithm has been fulfilled for a telephone number and only answering machine contact was made.	2	0.03
2.21	Selected respondent not available in field period.	5	0.06
4.50	The telephone number called was not a residential number. Included are businesses, institutions, agencies, modems, public facilities, vacation homes, group quarters.	4	0.05

Table 4-3. MATS 2014 landline extended interview sample dispositions (continued)

AAPOR code	Description	Count	Percent (%)
2.32	Non-Response: subject physically or mentally incapable of completing interview.	56	0.72
2.20	The telephone number was found to be not working when called.	32	0.41
4.54	Enumeration error – The respondent enumerated in the screener and selected for the extended interview is not a member of the household (typically occurs when visitors or family members living away are erroneously reported as household members.)	1	0.01
4.10	Other out of scope – The case is out of scope and no other final code applies.	0	0.00
2.112	Refusal – The selected respondent or a gatekeeper refused the interview or the selected respondent broke off during the interview and refused to continue.	1,645	21.04
2.112	Refusal – Results from a call to the Minnesota Department of Health or the study's toll-free line.	18	0.23
	Total	**7,820**	**100.00%**

Note that AAPOR dispositions account for each sampled phone number. The two tables account for the results of the sampled household members in the 7,820 completed household screeners as a second level of detailed disposition codes. For this reason, there is no corresponding AAPOR code for these cases in Table 4-2; rather, the AAPOR codes for these cases appear in Table 4-3. Separating the cases into the two operational stages provides a clearer understanding of the landline data collection outcomes, while still allowing all 119,370 sampled landline telephone numbers to be classified as to their outcomes according to the standard AAPOR disposition codes.

4.2.2 Cell Phone Sample Call Dispositions

Tables 4-4 and 4-5 show the detailed dispositions for all of the sampled cell phone telephone numbers that were released to data collection. Table 4-4 shows the dispositions for the screening of the 67,317 sampled cell phone numbers; Table 4-5 shows the dispositions of the 5,344 numbers for which a household screener was completed and from which an adult was selected for the MATS 2014 interview.

Table 4-4. MATS 2014 cell phone telephone number sample dispositions

AAPOR code	Description	Count	Percent (%)
N/A	Completed eligible screener	5,344	7.9
4.70	Cell phone not used by an adult over the age of 18.	1232	1.8
4.10	The sampled cell phone number is not used by anyone living in Minnesota.	1695	2.5
4.70	The sampled cell phone number is not used by a respondent who receives all or most of their calls on the cell phone.	3,305	4.9
4.46	The sampled number does not reach a cell phone.	73	0.1
2.35	All users of the sampled cell phone number are currently living out of state and will not be back before the end of data collection ("Snowbirds").	0	0.0
4.70	All users of the sampled cell phone number are currently attending school out of state and will not be back before the end of data collection.	0	0.0
2.36	Only eligible cell phone user already completed study on another phone number.	0	0.0
4.10	Other out of scope – The case is out of scope and no other final code applies.	0	0.0
2.331	Language Problem: unable to communicate due to a hearing or speech problem or unable to reach an English speaking household member.	380	0.6
2.20	The maximum calling algorithm has been fulfilled. At least one "human" contact has been made at the number and there are no refusals or language problems in the call history for the household.	1726	2.6
3.13	The calling algorithm has been fulfilled with no "human" or answering machine contact.	9968	14.8
3.14	The maximum calling algorithm has been fulfilled for a cell phone number and only answering machine contact was made.	10,248	15.2
4.50	The cell phone number is not used for personal use.	1236	1.8
4.30	The cell phone number was found to be not working when called.	17,102	25.4
2.111	Refusal –Screener respondent refused to be interviewed or broke off during the screener interview.	14,852	22.1
2.111	Refusal – Screener refusal results from a call to the Minnesota Department of Health or the study's toll-free line.	156	0.2
	Total	**67,713**	**100.0%**

Table 4-5. MATS 2014 cell phone extended interview sample dispositions

AAPOR code	Description	Count	Percent (%)
1.1	Completed interview.	4,004	74.9
4.10	Subject does not live in the state of Minnesota.	3	0.1
2.35	Subject is currently living out of state and will not be back before the end of data collection ("Snowbirds").	2	0.0
4.10	Subject is currently attending school out of state and will not be back before the end of data collection.	2	0.0
2.332	Language Problem: unable to communicate due to a hearing or speech problem or the selected respondent was unable to speak English.	24	0.4
2.20	The maximum calling algorithm has been fulfilled. At least one "human" contact has been made at the number.	389	7.3
2.22	The maximum calling algorithm has been fulfilled for a telephone number and only answering machine contact was made.		0.0
4.50	The cell phone number is not used for personal use.		0.0
2.32	Non-Response: subject physically or mentally incapable of completing interview.	6	0.1
2.20	The cell phone number was found to be not working when called.	31	0.6
4.54	Enumeration error – The respondent enumerated in the screener and selected for the extended interview is not a user of the cell phone number (typically occurs when friends or family members are erroneously reported as users of the cell phone.)	1	0.0
4.10	Other out of scope – The case is out of scope and no other final code applies.	0	0.0
2.112	Refusal – The selected respondent or a gatekeeper refused the interview or the selected respondent broke off during the interview and refused to continue.	872	16.3
2.112	Refusal – Results from a call to the Minnesota Department of Health or the study's toll-free line.	10	0.2
	Total	**5,344**	**100.0%**

4.2.3 Combined Sample Call Dispositions

Tables 4-6 and 4-7 show the detailed dispositions for all of the sampled telephone numbers (landline and cell combined) that were released to data collection. Table 4-6 shows the dispositions for the screening of the 186,687 sampled telephone numbers; Table 4-7 shows the dispositions of the 13,164 numbers for which a household screener was completed and from which an adult was selected for the MATS 2014 interview.

Table 4-6. MATS 2014 combined telephone number sample dispositions

AAPOR code	Description	Count	Percent (%)
1.1	Completed Screener	13,164	7.1
4.70	There is no one in the household age 18 or older to do the screener/Cell phone not used by an adult over the age of 18.	1,277	0.7
4.10	The sampled telephone number rings into a household not located in Minnesota/The sampled cell phone number is not used by anyone living in Minnesota.	1,831	1.0
4.70	The sampled cell phone number is not used by a respondent who receives all or most of their calls on the cell phone.	3,305	1.8
4.46	The sampled number does not reach a cell phone.	73	0.0
2.35	All household members/All users of the sampled cell phone number are currently living out of state and will not be back before the end of data collection ("Snowbirds").	0	0.0
4.70	All users of the sampled cell phone number are currently attending school out of state and will not be back before the end of data collection.	0	0.0
2.36	Sampled telephone number is part of MATS Cohort Study.	0	0.0
2.36	Only eligible household member/cell phone user already completed study on another phone number.	1	0.0
4.10	Other out of scope – The case is out of scope and no other final code applies.	0	0.0
2.331	Language Problem: unable to communicate due to a hearing or speech problem or unable to reach an English speaking household member.	559	0.3

Table 4-6. MATS 2014 combined telephone number sample dispositions (continued)

AAPOR code	Description	Count	Percent (%)
2.20	The maximum calling algorithm has been fulfilled. At least one "human" contact has been made at the number and there are no refusals or language problems in the call history for the household.	2,463	1.3
3.13	The calling algorithm has been fulfilled with no "human" or answering machine contact.	16,922	9.1
4.50	The telephone number was identified as non-residential during business purge preprocessing prior to CATI load.	5,036	2.7
3.14	The maximum calling algorithm has been fulfilled for a telephone/cell phone number and only answering machine contact was made.	14,592	7.8
4.50	The telephone number called was not a residential number. Included are businesses, institutions, agencies, modems, public facilities, vacation homes, group quarters/The cell phone number is not used for personal use.	5,193	2.8
4.30	The telephone number was identified as non-working during Tri-tone match processing prior to start of calling.	71,903	38.5
4.30	The telephone/cell phone number was found to be not working when called.	26,536	14.2
4.30	The telephone number resulted in no ring back during purge processing prior to CATI load.	1,985	1.1
2.111	Refusal –Screener respondent refused to be interviewed or broke off during the screener interview.	21,628	11.6
2.111	Refusal – Screener refusal results from a call to the Minnesota Department of Health or the study's toll-free line.	219	0.1
	Total	**186,687**	**100.0%**

Table 4-7. MATS 2014 combined extended interview sample dispositions

AAPOR code	Description	Count	Percent (%)
1.1	Completed interview.	9,304	70.7
4.10	Subject does not live in the state of Minnesota.	4	0.0
2.35	Subject is currently living out of state and will not be back before the end of data collection ("Snowbirds").	2	0.0
4.10	Subject is currently attending school out of state and will not be back before the end of data collection.	2	0.0
2.332	Language Problem: unable to communicate due to a hearing or speech problem or the selected respondent was unable to speak English.	81	0.6
2.20	The maximum calling algorithm has been fulfilled. At least one "human" contact has been made at the number.	1,088	8.3
2.31	Non-Response: subject deceased.	0	0.0
2.22	The maximum calling algorithm has been fulfilled for a telephone/cell phone number and only answering machine contact was made.	2	0.0
2.21	Selected respondent not available in field period.	5	0.0
4.50	The telephone number called was not a residential number. Included are businesses, institutions, agencies, modems, public facilities, vacation homes, group quarters/The cell phone is not used for personal use.	4	0.0
2.32	Non-Response: subject physically or mentally incapable of completing interview.	62	0.5
2.20	The telephone/cell phone number was found to be not working when called.	63	0.5
4.54	Enumeration error – The respondent enumerated in the screener and selected for the extended interview is not a member of the household (typically occurs when visitors or family members living away are erroneously reported as household members/users of the cell phone).	2	0.0
4.10	Other out of scope – The case is out of scope and no other final code applies.	0	0.0
2.112	Refusal – The selected respondent or a gatekeeper refused the interview or the selected respondent broke off during the interview and refused to continue.	2,517	19.1
2.112	Refusal – Results from a call to the Minnesota Department of Health or the study's toll-free line.	28	0.2
	Total	**13,164**	**100.0%**

4.3 MATS 2014 Response Rates

This section presents the survey response rates for MATS 2014. The method for calculating the MATS 2014 response rates is essentially the same as that used in the MATS 2010. Since two independent samples were drawn for the cell phone and landline interviews, the response rates are reported separately for each sample. Section 4.3.1 describes the methodology, including the two phases at which non-response could be encountered, formulas for response rate calculation, and the rationale for focusing on the weighted response rates. Sections 4.3.2 and 4.3.3 report the response rates for the screener and the extended phase respectively, followed by the overall response rates across both phases. Given the stratified design by geographic region and the interest to generate region-level estimates, the response rates by sampling region are also reported.

4.3.1 Methodology

Two independent RDD samples were fielded on landline phones and cell phones. Landline phones are usually considered household devices. For the MATS 2014, one adult was randomly sampled from each household for the extended interview once the screener had been completed. In contrast, researchers hold different opinions on whether a cell phone is a person-level or household-level device. Studies have shown that a non-negligible proportion of cell phone users share their phones with other household members, a common phenomenon even among cell phone-only and cell-mostly households. In the MATS 2014, cell phones were treated as household devices. During the screener interview, the respondent was asked whether other household members shared the cell phone, and if the answer was yes, within-household sampling was conducted to select a respondent for the extended interview. In summary, household members were identified for interviews in a two-phase process for both RDD samples. Screener interviews were conducted to enumerate and sample household members, and then an extended questionnaire, the MATS 2014 instrument, was administered to the sampled person. Although the screener respondent was automatically selected for extended interview in single-person households in both samples, and in the cell sample when no cell phone sharing occurred, the logic of the two-phase interview still applies to these cases conceptually. The discussions will generally refer to the screening target as “household” and the extended unit for the

MATS 2014 interview as "person." The response rates are provided at the following levels:

i. Household-level response to the screening interview;

ii. Person-level response to the extended interview, conditional on screener household response;

iii. Overall response across the screener and extended phases, which is the product of (i) and (ii). The overall response rate indicates the percentage of possible interviews that were completed taking both survey phases into account.

For each phase, the response rate is generally defined as the ratio of the eligible responding units (i.e., households or persons) to the (estimated) number of units sampled and eligible for the interview in that phase. The MATS 2014 response rates are based on the AAPOR standards.[6] All of the AAPOR response rate formulas collapse the numeric AAPOR disposition codes (Tables 4-2 through 4-5) and then assign them to the broad response categories in Table 4-8. The AAPOR formulas further collapse the latter into a few categories represented by the symbols that appear in the mathematical formula statements.

Table 4-8. AAPOR response rate formula categories

AAPOR response category	AAPOR response category meaning	Screener response rate formula category
I	Completed Interview	E
P	Partial Interview	N_e
R	Refusal and break-off	N_e
NC	Non-contact	N_e
O	Other	N_e
UH	Unknown if household occupied	N_u
UO	Unknown, other	N_u

[6] For reasons explained in Section 4.3.2, MATS 2014 developed an allocation factor to account for the proportion of non-response screener cases that were outside the population covered by each the two sample frames. This factor, called *f*, is not an AAPOR standard, although it is comparable in purpose and application to the AAPOR *e* factor applied to screener non-response to account for non-residential phone numbers among the non-responding screener sample.

AAPOR has two similar response rate formulas that are relevant to the MATS 2014, RR3 and RR4. The only difference between AAPOR RR3 and RR4 is that RR3 excludes partial completes from the numerator and RR4 includes them, resulting in a slightly higher response rate. RR4 can be used only if partial completes are weighted and included in the final data file. The MATS 2014 did not include partial completes in the analysis file and did not assign a final sample weight to them. To be included in the weighted file used for analysis, an interview had to have reached the last question, J11, J11a, or J11b, as applicable based on the skip pattern. Those that broke off before this point are accounted for in Tables 4-3 and 4-5 among the breakoffs.

The screener response rates for both samples are calculated using the following formula:

$$R_{screener} = \frac{E}{E + f(N_e + eN_u)}$$

where

E = number of responding households
N_e = number of nonresponding households (known to be residential ; unknown about whether the households belonged to the MATS 2014 target population)
N_u = number of cases with unknown residential status (due to non-contact)
e = estimated residential rate among nonresponding cases with unknown residential status
f = estimated proportion of the nonresponding residential cases that belonged to the MATS 2014 target population

For the MATS 2014, since there is no auxiliary information about the residential status of the non-contact cases or the proportion of the nonresponding residential cases that belonged to the target population, it is necessary to estimate the factors *e* and *f* in the screener response rate formula using the residential and eligibility rates among those whose status could be determined through the screener. Details will be discussed in Section 4.3.2.

The extended interview was administered only among the eligible adults sampled from the screener responding households. At the extended stage, there is no sampling unit

with unknown residential and/or eligibility status. The extended response rate is calculated at the person level using the simple formula:

$$R_{extend} = \frac{E}{E + N_e}$$

where

E = number of respondents to the extended interview
N_e = number of nonrespondents to the extended interview

Response rates can be either unweighted or weighted. The unweighted response rate, computed using the raw number of cases, provides a useful description of the success of the operational aspects of the survey. The weighted rate, computed by summing the weights for all the cases in both the numerator and denominator, gives a better description of the success of the survey with respect to the sampled population. For the MATS 2014, the unweighted and weighted response rates are essentially the same at the screener stage because an equal probability selection method was employed for selecting both samples. At the extended stage, the unweighted and weighted rates may differ moderately due to different weight adjustment factors associated with within-household selection. Sections 4.3.2 and 4.3.3 report the weighted response rates, since weighted response rates allow direct comparisons between different surveys with the same target population regardless of the sample design employed.

4.3.2 Screener Response Rates

Table 4-9 shows the counts of the phone numbers fielded in the MATS 2014 by response rate formula category. The four major types of residential status are 1) those identified as residential households that belonged to the target population of MATS 2014 (E and N_e), 2) those identified as residential households but not belonging to the MATS 2014 target population (I_{NT}), 3) those identified as nonresidential (primarily nonworking and business) phone numbers (I_{NR}), and 4) those phone numbers that, despite numerous attempts, could not be classified as either residential or nonresidential (N_u). The inclusion of the second type is driven mainly by the variety and large number of cases in the cell phone sample that were screened but not included in the interviewed sample (out of state, used exclusively by minors, not cell phone-only or cell phone-mostly), but

some of these situations also occur in the landline sample, although far less often. Calculation of response rate is complex because of the possible ways to estimate the residential rate among the phone numbers whose residential status was unknown as well as the proportion of non-responding households that belonged to the target population. In the landline RDD survey for MATS 2007, the residential rate was estimated using subfactor *e*'s of 0.27 and 0.63 for "No Answers" and "Answering Machines," respectively, which produced a blended *e* of 0.443. Since the MATS 2010, due to the changing telephone industry and our incomplete knowledge of cell phone usage pattern, *e* has been estimated using the Council of American Survey Research Organizations (CASRO) approach. The CASRO rate is computed by allocating the numbers with unknown residential status in the same proportion observed in the numbers with known residential status, which is considered a conservative approach.

$$e = \frac{E + N_e + I_{NT}}{E + N_e + I_{NT} + I_{NR}}$$

where

E = number of responding households
N_e = number of nonresponding households (known to be residential; unknown about whether the households belonged to the MATS target population)
I_{NT} = number of residential households determined (through the screening interview) to be out of scope of the MATS target population
I_{NR} = number of sampled phone numbers determined to be nonresidential

Table 4-9. Unweighted counts of phone numbers by screener response rate formula category

Screener response rate formula category	Landline sample	Cell phone sample
Residential respondents *(E)*	7,820	5,344
Nonrespondents known to be residential; unknown whether the households belonged to the MATS 2014 target population *(N_e)*	7,756	17,114
Residential households determined (through the screening interview) to be out of scope of the MATS 2014 target population (I_{NT})	118	6,305
Sampled phone numbers determined to be nonresidential (nonworking or business) *(I_{NR})*	92,315	18,338
Nonrespondents with unknown residential status due to non-contact (N_u)	11,298	20,216
Ring no answer	6,954	9,968
Answer machine	4,344	10,248

For the MATS 2014, all the sampled landline phone numbers have a flag indicating whether an address could be obtained for the phone number through the "reverse-match" process, so it is possible to take advantage of this information by estimating *e* separately for the landline phone numbers with and without matched addresses. The *e* value is calculated at the state level because the estimated *e* values by sampling region would be very unstable due to the small sample sizes for some regions. Table 4-10 shows that, among the cases whose residential status was determined, the residential rates among the cases with matched addresses are much higher than those without matched addresses, which is consistent with our expectation. The "reverse-match" operation is not possible for the cell phone sample, so a single residential rate is computed for the "ring no answer" group and the "answer machine" group respectively. The weighted average of *e* is 0.83 for the cell phone sample, and 0.39 for the landline sample. These values are lower than those in the MATS 2010 (0.95 for the landline sample and 0.42 for the cell phone sample) because smaller proportions of the "ring no answer" and "answer machine" cases are determined to be working residential numbers.

Table 4-10. Estimated residential rates (*e*) among different types of non-contact cases

Screener disposition	Landline sample		Cell phone sample
	With matched mailing address	Without matched mailing address	
Ring no answer	0.88	0.04	0.70
Answer machine	0.95	0.29	0.96

In the absence of any additional information for calculating the factor *f*, the proportion of nonresponding residential households that belonged to the MATS 2014 target population, this rate is estimated using the information collected during the MATS screening interview. The factor *f* is calculated as below, and a single value is obtained at the state level for stability. The estimated *f* is 97.7 percent for the landline sample and 45.9 percent for the cell phone sample. The low rate for the cell phone sample is due to the large proportion of residential cell phone numbers that were not the MATS target population (e.g. non-adult cell phone users, not cell phone-only or cell phone-mostly).

$$f = \frac{E}{E + I_{NT}}$$

where

E = number of responding households
I_{NT} = number of residential households determined (through the screening interview) to be out of scope of the MATS 2014 target population

The screener weighted response rates are calculated using screener result codes, the estimated *e* and *f*, and household base weights. The results are shown in Table 4-12, with 39.0 percent for the landline sample and 25.6 percent for the cell phone sample.

4.3.3 Extended Response Rates and Overall Response Rates

One adult was selected from each eligible, screened household for the extended interview. Table 4-11 gives the final status of all the adults sampled for the extended interview. A few cases were subsequently determined to be ineligible when contacted for the extended interview, because the person was found, for example, to live outside Minnesota or to be under age 18. This type of occasional screener response error occurs in every RDD survey. These persons (a total of 2 landline cases and 4 cell phone cases)

are excluded from both the numerator and denominator of the response rate formula. A person-level base weight is applicable at the extended phase, which is the product of the household-level base weight and the number of eligible adults sharing the phone number in the household. The weighted extended response rates are 65.7 percent for the landline sample and 73.5 percent for the cell phone sample, as shown in Table 4-12.

Table 4-11. Unweighted counts of sampled persons by extended response rate formula category

Extended response rate formula category	Landline sample	Cell phone sample
Respondents *(E)*	5,300	4,004
Nonrespondents *(N_e)*	2,518	1,336
Ineligible	2	4

Table 4-12 indicates that it is easier to obtain response on the landline than on the cell phone at the screener phase. However, once the screener has been completed, a cell phone case is more likely to respond to the extended interview than a landline case. This is probably because the majority of cell phones are personal devices (i.e. not shared by other household members), so the screener respondent himself/herself is very likely to be selected for the extended interview. In contrast, within-household sampling is applicable to the majority of landline cases, and it is more difficult to gain cooperation when a different person other than the one who has responded to the screener is sampled for the extended interview.

Table 4-12. Weighted response rates for landline and cell phone samples

Weighted response rate	Landline sample	Cell phone sample
Screener	39.0%	25.6%
Extended	64.7%	73.5%
Overall	25.2%	18.8%

The last row in Table 4-12 gives the overall weighted response rate for each sample, which is the product of the screener and extended rates. The two samples overall weighted response rates are 25.2 percent for the landline sample and 18.8 percent for the cell phone sample.

Separate response rates are also calculated and reported by sampling stratum, as shown in Table 4-13. While response propensity was generally consistent, there are variations in the response rates in some of the sampling strata. For example, on the landline side, the response rate for the Metropolitan stratum is noticeably lower compared to some other strata, and this is largely due to lower response propensity to the screening interview. For the cell phone sample, the northwest stratum seems to exhibit relatively lower response propensity in both the screener and extended interview. The differential response patterns by sampling strata may have some indications for the weighting adjustment, as will be discussed in Chapter 5.

Table 4-13. Weighted response rates by sampling strata

	Screener response rate (%)	Extended response rate (%)	Overall response rate (%)
Landline sample			
Central	40.2	64.7	26.0
Metropolitan	36.2	64.3	23.2
Northeast	42.4	65.7	27.8
Northwest	41.5	64.0	26.6
South Central	44.7	66.2	29.6
Southeast	44.2	66.4	29.3
Southwest	41.6	63.5	26.4
West Central	42.6	63.1	26.9
Cell phone sample			
Central	24.7	72.2	17.8
Metropolitan	25.7	73.8	19.0
Northeast	24.1	77.5	18.7
Northwest	23.3	69.4	16.2
South Central	24.9	70.4	17.6
Southeast	27.2	74.0	20.1
Southwest	26.2	73.5	19.3
West Central	28.0	72.9	20.4

4.4 Selected Operational Statistics

This section presents some statistics that characterize various operational aspects of MATS 2014.

4.4.1 Principal Sources of Non-response

4.4.1.1 Principal Sources of Non-response in Landline Sample

Table 4-14 summarizes the results for all landline cases, after eliminating the known non-working and non-residential numbers. Consistent with the AAPOR RR3 formula, this table collapses the screening and extended interview processes into a single set of results. For example, a screener refusal in one case and a completed screener that resulted in a refusal of the extended interview in another case are treated identically and count as two refusals in this table. The largest source of landline sample non-response was non-contact to the screener or extended interview: 52.5 percent out of the total 21,535 possible phone numbers that could have yielded a completed interview were not able to be contacted at one of the two stages. Refusal was the second-largest source of landline sample non-response. 8,502 cases (39.5 percent) resulted in a refusal at either the screener or extended stage. Combined, these two outcomes accounted for 92.0 percent of the total non-response. The remaining 1,733 cases (8.0 percent) were contacts that did not refuse, but did not complete the interview. These were cases where an initial contact requested a call-back but where future contact attempts were unsuccessful.

Table 4-14. Sources of non-response in landline sample, collapsed across screening and extended interview stages

	Count	Percent of non-respondents
Total non-respondents	21,535	100.0
Refused	8,502	39.5
No contact	11,300	52.5
Other	1,733	8.0

There is one point to keep in mind in regard to the numbers cited in the previous paragraph. First, as explained in Section 4.3, some undetermined proportion of the non-contact cases at the screener level were not really households, and the response rate formula discounted a proportion of them as non-residential. The statistics presented in this section are purely operational and count all non-contact cases as non-response. It is also informative, and more straightforward, to look at sources of non-response for the landline extended interview, that is, among the 7,820 adults selected for the interview from the completed screeners. Table 4-15 shows there were 7,818 eligible cases among the 7,820 selected. Those who were not eligible were individuals who, upon being contacted for the interview, were found to have been erroneously included as members of the household during the screener (e.g., guests, family members not currently residing in the household). There were 2,518 non-respondents, of whom the largest number were 1,663 refusals (66.0 percent of non-respondents and 21.3 percent of all eligible sample). Most of the remainder were individuals who could not be reached despite repeated attempts to do so, including the extra call attempts made beyond the protocol parameters. These were 758 cases, or 30.1 percent of non-response and 9.7 percent of all eligible sample. Combined, refusals and maximum contacts accounted for 2,421 non-respondents, or 96.1 percent of all non response and 31.0 percent of all eligible adult sample.

Table 4-15. Primary sources of non-response in landline extended interview sample

	Count	Percent of non-respondents (n = 2,518)	Percent of total eligible sampled (n = 7,818)
Total sampled	7,820	-	-
Ineligible/out of scope	2	-	-
Total eligible sampled	7,818	-	100.0
Total complete	5,300	-	67.8
Total non-respondents	2,518	100.0	32.2
Refused	1,663	66.0	21.3
Maximum contact attempts	758	30.1	9.7
Other	97	3.9	1.2

4.4.1.2 *Principal Sources of Non-response in Cell Phone Sample*

Table 4-16 summarizes the results for all cell phone cases, after eliminating the known non-working numbers and numbers not used for personal use. As in the landline non-response table above (Table 4-14), this table collapses the screening and extended interview processes into a single set of results. The largest source of cell phone non-response was non-contact to the screener or extended interview: 52.3 percent out of the total 38,635 possible cell phone numbers that could have yielded a completed interview were not able to be contacted at one of the two stages. Refusal was the second-largest source of cell phone non-response: 15,890 cases (41.1 percent) resulted in a refusal at either the screener or extended stage. Combined, these two outcomes accounted for 93.5 percent of the total non-response. As with the landline sample, most of the other non-response consists of cases that were initially contacted without a refusal, but where further contact attempts were unsuccessful.

Table 4-16. Primary sources of non-response in cell phone sample, collapsed across screening and extended interview stages

	Count	Percent of non-respondents
Total non-respondents	38,635	100.0
Refused	15,890	41.1
No contact	20,216	52.3
Other	2,529	6.5

As in the landline non-response discussion, the statistics presented in this section for the cell phone sample are purely operational and count all non-contact cases as non-response. Again, it is interesting to look at sources of non-response for the cell phone extended interview, that is, among the 5,344 adults selected for the interview from the completed screeners. Table 4-17 shows there were 5,340 eligible cases among the 5,344 selected. Most of those not eligible were individuals who, upon being contacted for the interview, were found to have been erroneously included as users of the cell phone number (e.g., friends, family members who do not receive calls on the cell phone number). There were 1,336 non-respondents, of whom the largest number were 882 refusals (66.0 percent of non-respondents and 16.5 percent of all eligible sample). Following the refusals were individuals who could not be reached despite repeated attempts to do so, including the extra call attempts made beyond the protocol

parameters. These were 413 cases, or 30.9 percent of non-response and 7.7 percent of all eligible sample. Combined, refusals and maximum contacts accounted for 1,295 non-respondents, or 96.9 percent of all non-response and 24.2 percent of all eligible adult sample.

Table 4-17. Primary sources of non-response in the cell phone extended interview sample

	Count	Percent of non-respondents (n = 1,336)	Percent of total eligible sampled (n = 5,340)
Total sampled	5,344	-	-
Ineligible/out of scope	4	-	-
Total eligible sampled	5,340	-	100.0
Total complete	4,004	-	75.0
Total non-respondents	1,336	100.0	25.0
Refused	882	66.0	16.5
Maximum contact attempts	413	30.9	7.7
Other	41	3.1	0.8

4.4.2 Refusal Conversion Results

Recontacting people who initially refuse to participate in an interview is designed to increase the sample size and response rates, and also to reduce bias associated with including in the sample only those who are most inclined to respond. This section describes the results of the refusal conversion efforts for the landline and cell phone screeners, and the landline and cell phone extended interviews, as summarized in Table 4-18 and Table 4-19. In table 4.18, the number of screeners converted refers to completed screeners that were screened as eligible. There were additional cases that initially refused and were then successfully contacted and identified as ineligible. From a technical perspective, the screeners were completed for these cases; however, this table focuses on showing how the refusal conversion effort improved the sample yield and thus only counts cases screened as eligible as successful conversions.

4.4.2.1 Screener Refusal Conversion Results

Table 4-18. MATS 2014 screener refusal conversion

	Landline screener	Cell phone screener	Combined screener
Assigned to data collection	119,370	67,317	186,687
Initially refused (#)	8,657	17,668	26,325
Converted (#)	1,563	968	2,531
Converted (%)	18.1%	5.5%	9.6%
Total completed	7,820	5,344	13,164
Converted as percent of completed	20.0%	18.1%	19.2%

Landline Screener Conversion. At the screener stage, the initial telephone contact resulted in a refusal to respond to the landline screener questions at 8,657 landline phone numbers. After conversion attempts with the initial landline refusals, 1,563 of these cases became completed screener interviews, representing a conversion rate of 18.1 percent and constituting 20.0 percent of the total 7,820 completed screeners.

Cell Phone Screener Conversion. The initial cell phone contact resulted in a refusal to respond to the cell phone screener questions at 17,668 cell phone numbers. After conversion attempts with the initial cell phone refusals, 968 of these cases became (eligible) completed screener interviews, representing a conversion rate of 5.5 percent and constituting 18.1 percent of the total 5,344 completed cell phone screeners. As compared to the landline screener, it was more difficult to convert a cell phone screener refusal. While there are many possible explanations for the lower conversion rate in the cell phone sample, one explanation could be due to the fact that cell phones are often used by one individual, while landline phones are often used by multiple members of a household. When calling back to convert a landline refusal, there is a greater chance of reaching a different (and willing) respondent than when calling cell phone refusals. Also, the cell phone sample had larger numbers of ineligible cases as cell phones were much more likely than landlines to be used exclusively by someone under the age of 18 or to be used by someone living outside of Minnesota. Also, cell phone cases had to meet the criteria of being cell-only or cell-mostly. Very few initial screener refusals from the landline sample (n=22) were found to be ineligible during conversion, while this number was considerably larger for the cell sample (n=1352). The screener conversion

success rates including cases screened as ineligible were 18.3% for landline and 13.1% for cell.

Combined Screener Conversion. Overall at the screener stage, the initial contact resulted in a refusal to respond to the screener questions at 26,325 phone numbers. After conversion attempts with the initial refusals, 2,531 of these cases became completed screener interviews, representing a conversion rate of 9.6 percent and constituting 19.2 percent of the total 13,164 completed screeners.

4.4.2.2 Selected Household Member Conversion

Table 4-19. MATS 2014 extended interview refusal conversion

	Landline extended	Cell phone extended	Combined extended
Assigned to data collection	7,820	5,344	13,164
Initially refused (#)	1,875	946	2,821
Converted (#)	385	147	532
Converted (%)	20.5%	15.5%	18.9%
Total completed	5,300	4,004	9,304
Converted as percent of completed	7.3%	3.7%	5.7%

Conversion of Selected Household Members in Landline Sample. Among the household members selected for the MATS 2014 interview in the landline sample, 1,875 initially refused to respond to the interview. After conversion attempts, 385 of these completed the interview. This is a conversion rate of 20.5 percent, representing 7.3 percent of the total 5,300 completed landline interviews.

Conversion of Selected Cell Phone Users in Cell Phone Sample. Among the cell phone users selected for the MATS 2014 interview in the cell phone sample, 946 initially refused to respond to the interview. After conversion attempts, 147 of these completed the interview. This is a conversion rate of 15.5 percent, representing 3.7 percent of the total 5,300 completed landline interviews. While it was easier to convert a landline *screener* refusal than a cell phone screener refusal, there is not a large difference in the landline and cell phone extended conversion rates. Using the same logic discussed above, the landline respondent has already been selected at the extended level, so the conversion attempt must be made with the same respondent. The landline extended

interview conversion no longer has the possibility of reaching a different household member who may be more willing to complete the interview.

Conversion of Selected Respondents in Combined Sample. Among the respondents selected across both samples, 2,821 initially refused to respond to the extended interview. After conversion attempts, 532 of these completed the interview. This is a conversion rate of 18.9 percent representing 5.7 percent of the total 9,304 completed interviews.

4.5 Interview Timing

Tables 4-20 and 4-21 present statistics about the length of time it took to administer the MATS 2014 interview. Table 4-20 shows the mean, minimum, and maximum lengths for the cell phone and landline screener; Table 4-21 shows the mean, minimum, and maximum lengths of extended interview for the overall sample and for different smoking statuses.

Table 4-20. Screener lengths (minutes)

Sample Group	Mean	Minimum	Maximum
Cell phone	2.1	0.7	14.4
Landline	2.0	0.8	10.6

Table 4-21. Extended interview lengths (minutes)

Sample Group	Mean	Minimum	Maximum
Current smokers	20.6	11.3	49.7
Former smokers	14.2	6.8	53.8
Experimenter smokers	12.4	6.3	39.3
Never smokers	11.7	6.1	90.9
All respondents	13.8	6.1	90.9

Overall, the average extended interview lasted just under 14 minutes. The design target for the MATS 2014 extended questionnaire was a 20% reduction from the 15-minute 2010 interview (i.e. 12 minutes). As expected, interviews with current and former smokers took longer to complete than did those with experimental and never smokers, with the current smokers requiring the most time on average, owing to the largest number of questions applying to their circumstance.

5. Weighting

The objective of the MATS 2014 survey is to not only make inferences about the entire civilian, non-institutionalized adult population in Minnesota, but also allow comparison between the eight geographic regions defined as groups of adjacent counties. Sample weights are created so that population estimates can be calculated using the results of a survey from a sample of a finite population. Weighting is necessary to account for the differential probabilities of selection and to reduce potential bias due to non-response and differential coverage of subpopulations. Although weighting adjustments are aimed at reducing bias, these adjustments typically introduce variation in the weights, which increases the variances of survey estimates. Care was taken in the development and implementation of the weighting methodology for the MATS 2014 to meet the analysis needs and balance the bias reductions against the potential increases in variance.

Two Random Digit Dialing (RDD) samples were selected and fielded for MATS 2014, one on landline phones, and the other on cell phones. The weighting process consists of the following stages:

1. Create household-level base weights that reflect the different probabilities of selection for the sampled phone numbers from landline and cell phone frames by region. Then adjust these weights for screener non-response and multiple phone numbers in a household.

2. Calculate person-level weights to account for within-household sampling, and then adjust for non-response to extended interviews.

3. Conduct a composite weighting adjustment on the overlap component between the two samples – the cell phone-mostly group – as described in Chapter 2.

4. Calibrate the composite weights to the population totals estimated from reliable external sources to further reduce remaining non-response and non-coverage errors. A trimming and re-calibration step was also incorporated into this stage.

Parallel weighting adjustments were conducted for the landline and cell phone samples separately in stages 1 and 2 before the two samples were put together for stages 3 and 4. Only one set of weights was created for the combined dataset including the respondents from both samples, which can be used to produce estimates for the entire adult population in Minnesota as well as its subgroups. Sections 5.1 through 5.4 cover each of the four weighting stages. Some of the stages involve multiple steps, which will be discussed in greater detail below. The MATS 2014 weighting method is very similar to the MATS 2010 method, except that the regional information was used in some steps to account for the differential sampling rates, response propensities across regions as well as the analytical interest by region.

5.1 Household-Level Weights

As discussed in Chapter 2, both cell phone and landline phones were treated as household devices in MATS 2014. The primary purpose of the screening interview was to provide information required to assess the eligibility of household members for the MATS 2014 interview. Household weights were calculated solely for use as a basis for computing person-level weights for the analysis of interview data.

The household-level weight for household *j* sampled from stratum *s* through phone type *p*, $HHW_{j(ps)}$, is the product of three factors:

- Base weight of the telephone number sampled from phone type *p* and sampling stratum *s*, where sampling stratum corresponds to geographic region of interest ($A_{j(ps)}$);
- Adjustment for screener non-response ($B_{j(ps)}$); and
- Adjustment for the number of telephone numbers in a household ($C_{j(p)}$).

The procedure for computing the household-level weights for each sample is described in Sections 5.1.1 through 5.1.3.

5.1.1 Household Base Weights

Each sampled telephone number was assigned an initial base weight, and this was done separately by sampling stratum for each of the two RDD samples. This initial base

weight was computed as the inverse of the probability of selection of the telephone number from the stratified sampling frame. Since differential selection probabilities were used across the sampling strata, the base weights ($A_{j(ps)}$) range from 22.25 to 62.71 for all the 119,370 landline phone numbers sampled from the landline frame. As mentioned in Section 2.2, the cell phone sample included two groups of cases – 66,249 selected from the cell phone frame with the base weights ranging from 34.95 to 173.10 and 1,068 selected from the landline frame with the base weights ranging from 23.35 to 71.92. The latter group (1,068 cases) was determined to be cell phone numbers through the process of purging non-working and non-residential telephone numbers from the landline sample after sample selection. Table 5-1 shows the distribution of the base weights by sampling strata and the phone types they were sampled through.

Table 5-1. The MATS 2014 base weight distribution

Sampling Stratum	Landline cases, all sampled from the landline frame		Cell phone cases			
			Sampled from cell phone frame		Sampled from landline frame	
	Number of sampled cases	Base weight	Number of sampled cases	Base weight	Number of sampled cases	Base weight
Central	13,216	55.50	4,073	158.78	114	52.81
Metropolitan	46,582	62.71	23,495	173.10	525	71.92
Northeast	7,920	42.29	4,978	83.07	93	34.62
Northwest	11,662	26.34	8,808	42.80	67	26.86
South Central	7,699	39.89	6,383	62.57	66	37.20
Southeast	9,000	53.03	4,476	140.82	78	52.48
Southwest	11,659	30.19	8,425	47.48	65	32.18
West Central	11,632	22.25	5,611	34.95	60	23.35

5.1.2 Adjustment for Screener Non-response

This step adjusts for households that did not respond to the screener. Each sampled telephone number was classified as a respondent (*R*), a nonrespondent (*NR*), or an ineligible case (*I*). The base weights of the nonrespondent cases were distributed to the weights of the respondent cases. Separate adjustments were made by the sampling stratum and phone type because the screener response propensities varied noticeably not only between cell phone and landline, but also across different sampling strata. No

additional information was available at the screener phase to form more refined non-response adjustment cells within each sampling stratum and phone type. The non-response adjustment factor $B_{j(ps)}$, applied to each responding household j in phone type p and stratum s is

$$B_{j(ps)} = \frac{\sum_{j(ps)\in R} A_{j(ps)} + \sum_{j(ps)\in NR} A_{j(ps)}}{\sum_{j(ps)\in R} A_{j(ps)}}$$

5.1.3 Adjustment for Multiple Telephone Numbers in Household

At the end of the landline screener interview, information about the existence of additional telephone numbers and their use in the household was collected. If the household had an additional telephone number for residential use (not solely for business, fax or computer use), the selection probability associated with the household was higher and the weight had to be adjusted to account for this. For the cell phone sample, if there were multiple persons in the household, each with a cell phone that was not shared by other household members, then the multiple phone number adjustment factor should be cancelled out by the weighting factor for within-household selection (to be discussed in Section 5.2.1). To keep the implementation simple, a factor of 1 was applied for all the cell phone sample cases in this step.

The adjustment factor for multiple phone numbers is independent of the sampling stratum and takes the following values:

$C_{j(ps)}$ = 1 if phone type p indicates cell phone
= 1 if phone type p indicates landline and household j has no more than one telephone number
= 0.5 if phone type p indicates landline and household j has more than one telephone number

In this adjustment, it is standard practice to assume that there is at most one additional residential use telephone number in the household. Research has shown that there are too few households with more than two such numbers to significantly affect the weight distribution even if the inverse of the exact number of phone lines is used in the formula.

Thus, the household-level weight for household *j* in sampling stratum *s* of phone type *p*, $HHW_{j(ps)}$, is given by:

$$HHW_{j(ps)} = A_{j(ps)} \cdot B_{j(ps)} \cdot C_{j(s)}$$

As in the MATS 2010, all the initial refusals were subject to refusal conversion during the MATS 2014 data collection period. By doing so, there was no longer any need for computing and applying a household adjustment factor for refusal conversion subsampling as was done for the MATS 2007,because the adjustment factor would equal 1 for all the cases.

5.2 Person-Level Weights

Household-level weights were used as the starting point for creating person-level weights. The person-level weight for sampled person *k* in household *j*, sampling stratum *s* of phone type *p*, $PW_{jk(ps)}$, is the product of the household-level weight and two weighting adjustment factors:

- Adjustment factor associated with within-household selection ($D_{jk(p)}$);
- Adjustment for the MATS 2014 extended interview unit non-response ($E_{jk(pc)}$).

Both adjustment factors were calculated independent of the sampling stratum *s*. The procedure for computing the person-level weights for each sample is described in Sections 5.2.1 and 5.2.2.

5.2.1 Adjustment for Within-Household Selection

For both phone types, the extended interview was administered to only one person per household. The within-household sampling adjustment factor for person *k* from household *j* interviewed through phone type *p* is:

$$D_{jk(p)} = N_{j(p)}$$

where $N_{j(p)}$ is the number of eligible adults in household *j* with phone type *p*, that shared the sampled telephone number.

For the landline cases as well as the cell phone cases where the phone was shared, the adjustment factor is equal to the number of eligible adults in the household (standard landline RDD protocol simply assumes that all adults in a household "share" the sampled phone number). For the cell phone sample, if the screener respondent reported that the phone was not shared by any other adult household members, then he/she was invited to continue with the extended interview directly, and thus received an adjustment factor of 1 for within-household selection. Similar to what was done in the MATS 2010, the statisticians decided to set the maximum value for this adjustment factor to 3 for the shared cell phone cases in the MATS 2014 because the proportion of households with more than three adults sharing a single cell phone is very small. For the landline sample, no upper limit was set for this adjustment factor.

For each sampled person *k* from household *j* in sampling stratum *s* of phone type *p*, the person-level weight before extended non-response adjustment, $UPW_{jk(ps)}$, can be calculated as the product of the household-level weight and the adjustment factor for within-household sampling:

$$UPW_{jk(ps)} = HHW_{j(ps)} \cdot D_{jk(p)}$$

5.2.2 Adjustment for Extended Interview Non-response

The adjustment for extended interview non-response is very similar to what was done for the screener phase, except that it is possible to use the variables collected during the screening interview to form non-response adjustment cells. The data suggests little correlation between the extended interview response propensity and sampling stratum, so the non-response adjustment cells were formed using the sampling strata. The non-response adjustment factor, $E_{jk(pc)}$, applied to each respondent *k* from household *j* in adjustment cell *c* of phone type *p* is

$$E_{jk(pc)} = \frac{\sum_{jk(ps)\in R_{pc}} UPW_{jk(ps)} + \sum_{jk(ps)\in NR_{pc}} UPW_{jk(ps)}}{\sum_{jk(ps)\in R_{pc}} UPW_{jk(ps)}}$$

For the landline sample, household size (i.e. number of eligible adults in the household) was used for forming the non-response adjustment cells. For the cell phone sample,

since phone usage questions were asked during the screening interview, the non-response adjustment cells were formed by crossing three pieces of information: 1) whether the sampled person was in a cell phone-only or cell phone-mostly household; 2) household size; and 3) whether the cell phone was for personal use only or for both personal and business use. Any missing values for the above variables were imputed in order to categorize each person into a non-response adjustment cell. Random allocation was used to impute the data because the percent of missingness was very small. The algorithm ensures that the distributions of the imputed values are the same as the distributions of the respondent-reported non-missing values.

The person-level weight for person *k* from household *j* associated with phone type *p*, sampling stratum *s*, and extended nonresponse adjustment cell *c*, $PW_{jk(psc)}$, is calculated as:

$$PW_{jk(psc)} = UPW_{jk(ps)} \cdot E_{jk(pc)}$$

5.3 Composite Weights

Although separate person-level weights were created for landline and cell phone cases, as described in Section 5.2, it is inappropriate to generate population estimates using either sample by itself. Each sample covers only a subset of the Minnesota adult population and these subsets also overlap somewhat. Specifically, the landline sample is missing the cell-only households and the cell phone sample includes the cell-only and cell-mostly households; the cell sample and the landline sample both include the cell-mostly households. Given this, the next step was to combine the two samples into one

dataset and develop a single set of weights (referred to as composite weights). The composite weight, $PW_{jk(comp)}$, for person k in household j, is calculated as:

$$
\begin{aligned}
PW_{jk(comp)} &= \lambda \cdot PW_{jk(cellphone)} && \text{for cell phone-mostly cases in cell phone sample} \\
&= (1-\lambda) \cdot PW_{jk(landline)} && \text{for cell phone-mostly cases in landline sample} \\
&= PW_{jk(cellphone)} && \text{for other cases in cell phone sample} \\
&= PW_{jk(landline)} && \text{for other cases in landline sample}
\end{aligned}
$$

where λ is the compositing factor for the overlapping cell phone-mostly cases.

Careful considerations were given to the determination of λ associated with the cell phone-mostly cases covered by both samples to balance the trade-off between bias and variance. A single compositing factor is used to combine the cell-mostly cases from the landline sample and cell phone sample regardless of the regional information because choosing different compositing factors by region would increase the variance without reducing bias significantly, due to the very small sample sizes associated with the cell mostly population in some regions. For MATS 2014, λ was calculated to be 0.56 to minimize the mean squared error for the estimated percentage of cell phone-mostly persons among the Minnesota adult population.

5.4 Calibration to External Population Totals

The last stage of weighting was to calibrate the composite person-level weights to Minnesota adult population estimates. Calibration to population control totals is a commonly used estimation procedure to reduce potential bias and variance. The calibration method used for the MATS 2014 was raking, an iterative procedure where the weights are benchmarked to multiple sets (or dimensions) of marginal control totals in a sequential order until the sums of the raked weights equal the marginal control totals for all the dimensions or the differences are within a specified tolerance level. Two data sources were used to obtain the population estimates: 1) demographic information from the 2013 American Community Survey; and 2) distribution of phone status from the most recent National Health Interview Survey. As in the MATS 2010, phone status was included as a dimension for calibration because tobacco use behavior was believed to be associated with landline/cell phone ownership and usage (e.g., cell-

only or cell-mostly) pattern. Due to the regional-based sample design and the interest in obtaining regional estimates, a new raking dimension "region" (according to the respondent self-reported information) was added to the MATS 2014 calibration process to improve the face value of the survey without introducing any significant changes on the state-level estimate, either overall or by key demographic characteristics. The new "region" dimension was inserted after the "metro/mon-metro by collapsed race" dimension used in the MATS 2010, and "education by age" remains the last dimension as in the MATS 2010 because the smoking prevalence rates are most sensitive to these two variables. The raked weight, RPW_{jk}, can be expressed as

$$RPW_{jk} = PW_{jk(comp)} \cdot \prod_{d=1}^{D} RF_{dl}$$

where RF_{dl} is the raking factor for dimension d, level l which respondent jk is in. For example, if the 4th dimension (d =4) is sex with two levels (l=1 for male and l=2 for female), then the raking factor for this dimension is RF_{41} for the adult male. The raking factors are derived so the following relationship holds for every raking dimension d, level l:

$$CNT_{dl} = \sum_{jk} \delta_{dljk} \cdot RPW_{jk}$$

where CNT_{dl} is the control total, and δ_{dljk} = 1 if adult k in household j is in level l of dimension d and δ_{dljk} = 0, otherwise. The MATS 2014 weights were raked to the six dimensions defined in Table 5-2. Raking to these six dimensions simultaneously controlled for phone status, gender, age, race/ethnicity, educational attainment, and geographic region. A very small proportion of these variables had missing values and were imputed using the same method as described above in Section 5.2.2.

Table 5-2. Description of variables used to define MATS 2014 RDD raking cells

Raking dimensions	Raking cell definitions
Dimension 1	
Telephone status/usage	Having cell phone only
	Having cell phone mostly
	Having landline and cell phone, but not cell phone mostly
	Having landline only
Dimension 2	
Gender x Age groups	Male, 18 to 24 years
	Male, 25 to 29 years
	Male, 30 to 34 years
	Male, 35 to 44 years
	Male, 45 to 54 years
	Male, 55 to 64 years
	Male, 65 years and older
	Female, 18 to 24 years
	Female, 25 to 29 years
	Female, 30 to 34 years
	Female, 35 to 44 years
	Female, 45 to 54 years
	Female, 55 to 64 years
	Female, 65 years and older
Dimension 3	
Race/Ethnicity	Hispanic
	Non-Hispanic, White
	Non-Hispanic, African American
	Non-Hispanic, Asian
	Non-Hispanic, Native American, Pacific Islander
	Non-Hispanic, Other race, 2 or more races

Table 5-2. Description of variables used to define MATS 2014 RDD raking cells (continued)

Raking dimensions	Raking cell definitions
Dimension 4	
Metropolitan/Non-metropolitan x Collapsed Race	Metropolitan, Hispanic
	Metropolitan, Non-Hispanic, White
	Metropolitan, Non-Hispanic, African American
	Metropolitan, Non-Hispanic, Asian
	Metropolitan, Non-Hispanic, Native American, Pacific Islander, Other race, 2 or more races
	Outside Metropolitan, Hispanic
	Outside Metropolitan, Non-Hispanic, White
	Outside Metropolitan, Non-Hispanic, African American, Asian, Native American, Pacific Islander, Other race, 2 or more races
Dimension 5	
Region	Central, Metropolitan, Northeast, Northwest, South Central, Southeast, Southwest, West Central
Dimension 6	
Educational attainment x Age	Less than HS degree by the age groups in dimension 2
	HS degree or equivalent, by the age groups in dimension 2
	At least some college, by the age groups in dimension 2
	BS degree or above, by the age groups in dimension 2

Due to the accumulative effect of all the weighting steps described above, very large weights resulted for a small number of cases, which would drive up the variance of the estimates. Weight trimming to reduce the impact of such large weights was conducted at the region level due to the stratified design as well as the interest in generating region level estimates in the MATS 2014. In particular, the cutoff thresholds at which the weights were trimmed were determined by region because the base weights were different across regions due to differential sampling rates. The portions of the trimmed weights were redistributed to other cases by sample type (i.e. cell phone and landline)

and within the same region where the weights were trimmed, and the calibration operation described above was then reapplied to the trimmed/redistributed weights. This iterative process was repeated five times. Weight trimming is commonly used in regular survey practice. At both the state level and region level, evaluation was conducted using the smoking prevalence estimate to ensure that the potential small bias introduced through trimming was outweighed by the variance reduction, such that a reduction in the overall mean squared error was expected.

6. Comparability with Previous MATS Surveys and Limitations of the Data

It is helpful for users of the MATS 2014 data to be aware of the survey methods described in this methodology report when analyzing the data, interpreting the findings, reading reports, and applying the results to historical assessment and planning for the future. It is likewise helpful for them to be informed of any known or potential limitations that apply to the use of the data. Finally, when comparing the results of MATS 2014 to those of previous MATS surveys, it is important to consider methodological factors that may affect the comparability of the data from one round to the next. This report focuses mainly on comparability of MATS 2014 with the immediately previous round, MATS 2010, but also examines comparability across all five rounds when relevant and feasible.

6.1 Comparability issues

6.1.1 Sampling

From the sample design perspective, the MATS 2010 and the MATS 2014 were similar except that the MATS 2014 sample was allocated by geographic region (i.e., group of counties in the state of Minnesota) due to the interest in regional estimates. The stratification by region does not affect the comparability of estimates between MATS 2010 and MATS 2014. The two designs targeted the same inference population and had similar general coverage of that population.

6.1.1.1 Similarities between the 2010 and 2014 Sample Design

The sample design for 2010 and 2014 were similar in many aspects. First of all, a dual-frame RDD sample including landline and cell phone was used in both the MATS 2010 and the MATS 2014. Both designs employed a take-all approach for the landline sample and a screening for cell-only and cell-mostly approach for the cell phone sample.

Second, the eligibility criteria were the same between the MATS 2010 design and MATS 2014 design. The sampled telephone number must belong to a household located in Minnesota (in the landline sample) or an adult of Minnesota (in the cell phone sample);

otherwise the household/adult would be ineligible for the survey. The MATS 2014 also used the same protocol as in the MATS 2010 for handling students living away from home – they were eligible to be sampled from a screened household if they were considered members of the household and did not live in their own apartment at school (e.g., they lived in a dorm or fraternity/sorority house). If the sampled RDD telephone number reached a Minnesota residence where a student himself or herself was currently dwelling, then he/she would be eligible to be selected into MATS 2014. These principles also represent the final rules from MATS 2007 that evolved during data collection.

Third, the MATS 2014 within-household sampling method was the same as that used in the MATS 2010. In a landline household with multiple adults or a cell phone household where the sampled cell phone number was shared, the Rizzo method (Rizzo et al 2004) was used to randomly sample one adult per household. As in the MATS 2010, there was no oversampling of young adults or minority persons during the within-household sampling phase in the MATS 2014.

Finally, the same sampling protocol was used for refusal conversion in MATS 2010 and MATS 2014. That is, for both landline and cell phone sample, all the households were eligible to be converted after the initial refusal except for a small number of refusals considered hostile.

6.1.1.2 Differences between 2010 and 2014 Sample Design

Three major factors drove the differences between the designs in the MATS 2010 and the MATS 2014. First, telephone ownership and usage among the Minnesota population had changed significantly since the MATS 2010 data collection. At the national level, the proportion of adult population living in cell-only households had been increasing by about 2 percentage points annually, so a higher proportion of the adults in Minnesota were expected to be in the cell-only households in 2014 than in 2010. Due to the growing cell-only and cell-mostly population and the changing cost function of RDD cell phone data collection compared to RDD landline data collection, a larger proportion of the sample was assigned to cell phone to make the MATS 2014 survey design more cost-efficient. An appropriate weighting approach was used to composite the cell phone sample and landline sample, so the change in sample allocation should not affect the comparability of the estimates between MATS 2010 and MATS 2014.

Second, a new and enhanced landline RDD sampling frame was used to improve the coverage of the inference population. In recent years, an increasing number of households have been shifting from traditional landline to alternative providers (including cable companies and Voice over Internet Protocol (VoIP) providers), which are not covered by the type of sampling frame used in MATS 2010. According to the sample frame vendor, the new frame accounted for nearly all landline telephone numbers (published and unpublished), including those offered by traditional telephone companies (ILEC) as well as cable and VoIP providers (CLEC), and thus eliminated the concerns about the coverage of the type of landline frame used in the MATS 2010. Using this newer sampling frame does not bring in any new population, but simply covers the part of the inference population that would have been missed in a frame containing only ILEC landline numbers (which is the type of frame used in the MATS 2010). Sampling from this new and enhanced frame helps maintain comparable non-sampling error structure for the MATS 2010 and MATS 2014.

Third, the MATS 2014 used stratified sampling within the landline frame and cell phone frame to allow the data user to better understand tobacco use, quitting, and second-hand smoke exposure at the regional level and the differences between the regions. Differential sampling rates were applied to telephone numbers associated with different regions in Minnesota (i.e., counties grouped by geography). The MATS 2014 design aimed to improve regional estimates at the expense of modestly increased overall sample size while maintaining the precision of state-wide estimates. An optimal sample allocation solution was chosen to benefit the comparison involving small regions with only a limited reduction in the reliability of the state-level estimates. This resulted in a stratified design with at least eight percent of the sample allocated to each of the eight regions. The regional allocation does not affect the value of the state estimates because an appropriate weighting method was used to account for the effect of differential sampling rates.

6.1.2 Weighting

6.1.2.1 Reducing Potential Nonresponse Bias through Weighting

Potential nonresponse bias could occur when a survey failed to obtain response from all the sampled units, although lower response rate does not necessarily equate to higher

nonresponse bias. As discussed in Section 4.3, the response rate for the MATS 2014 was substantially lower than the response rate for the MATS 2010. The decrease in response propensity of the adult residents in Minnesota was largely due to a changing environment for the telephone RDD surveys, which was observed in other prestigious RDD studies such as California Health Interview Survey. Telephone still remains as a good data collection mode for administering a survey when the questionnaire involves complex skip patterns, as in the MATS 2014 questionnaire. At the same time, the telephone data collection mode has become less effective as a way to contact the target respondents and solicit participation.

The weighting adjustment accounts for the discrepancies in the response propensities of the target respondents based on demographic characteristics such as age, education, and race/ethnicity. This can eliminate potential nonresponse bias to some extent because some of the demographic characteristics such as age and education are highly correlated to the key survey measures such as smoking prevalence.

6.1.2.2 The Role of Regional Design on Weighting

Due to the strong interest in trend analysis, the MATS 2014 weighting methodology was kept as consistent as possible to the MATS 2010 methodology unless the regional differentials play an important role. For example, a single compositing factor was used to combine the cell-mostly cases from the landline sample and cell phone sample regardless of the regional information. This is because choosing different compositing factors by region would increase the variance without reducing bias significantly, due to the very small sample sizes associated with the cell mostly respondents in some regions.

6.1.3 Data Collection

All of the MATS survey data were collected using computer-assisted telephone interviewing. They all used standard survey research interviewer training and interviewing protocols. All data collection protocols for MATS 2014 were essentially identical to those used in MATS 2010, with the only difference being the fact that MATS 2014 data collection was slightly longer to accommodate the larger scope, response rate challenges, and management of regional targets. These challenges also caused MATS

2014 to have a higher percentage of interviews completed towards the end of the data collection period as compared with MATS 2010.

6.1.4 Questionnaire Design and Specification

There are two main areas where questionnaire design may affect comparability. The first area is the questionnaire content, which refers to the selection of questions, response categories, and the formulation of their specific wording and ordering. This area also includes the introductory text and transition phrases, as well as prompts, probes, and instructions to be used by the interviewers.

The second area is the determination of which respondents are administered each question and, for some questions, an alternative, more suitable phrasing of the question. This concept is commonly referred to as the "skip patterns" for the questionnaire. Some questions will not apply to certain groups because of who they are (questions about quitting smoking are not relevant to never smokers) or how they answered a specific question (if a person has not seen a health care provider in the past 12 months, it is logical to skip the questions about their experiences with health care providers in the past 12 months). The group who receives each question is usually referred to as the "base" for that question. In administering the questionnaire, the skip instructions determine and control who receives each question. All of these concepts are captured in detailed questionnaire specifications and in the programming instructions for CATI questionnaires.

6.1.4.1 Questionnaire Content

Section 3.1 described the general questionnaire design process and general issues and factors considered in formulating the question items, wording, and response categories. As noted there, and as elaborated in the Minnesota Adult Tobacco Survey 2014 Comparability Report and its item-by-item crosswalk comparison between MATS 2010 and 2014, there are a number of questions that appear in only one of the two most recent MATS questionnaires. Such questions, by definition, have no comparable items for trend comparison across the survey rounds. When previous items were omitted from the MATS 2014 questionnaire, the resulting absence of trend data was consciously anticipated in the design, either because the items were no longer of interest or had not been useful in the past, or because some items needed to be eliminated as a trade-off to

accommodate new items. In addition, when new items were added, it was because of new or changing research objectives. While historical trends cannot currently be analyzed for new MATS 2014 items, MATS may choose to retain such items in the future and monitor the trend from MATS 2014 forward.

In addition to noting questions that exist only in MATS 2010 or MATS 2014, the MATS 2014 comparability report and questionnaire crosswalk fully document a few wording changes made to clarify meaning, add or improve response categories, or simplify administration of questions appearing in both rounds. For the most part, the changes were minor and would not hinder meaningful comparisons across time. Appendix G discusses the nature and possible effect on comparability of MATS 2010 questionnaire items that were significantly modified for MATS 2014. The question numbers refer to the MATS 2014 questionnaire attached as Appendix A.

6.1.4.2 Skip Patterns in MATS 2014 Compared to MATS 2010

By design, all major skip patterns and conditions in MATS 2014 were preserved from MATS 2010 for items and sections common to both questionnaires. The removal of some MATS 2010 questions included the removal of skip patterns that pertained to those removed questions while some new questions for MATS 2014 included skip conditions. However, there were no changes to skip patterns from MATS 2010 to MATS 2014 that would affect the comparability.

6.2 Potential Limitations of the Data

All of the Minnesota Adult Tobacco Surveys yield data that provide highly accurate and detailed representations of the smoking-related attitudes, beliefs and behaviors of Minnesota's adult residents at various points in time. However, statistics produced from sample surveys are subject to two general types of error, technically referred to as sampling error and nonsampling error. The term "error" does not refer to a mistake or a known error but to the fact there may be some difference between the survey statistic and the actual statistic for the entire population that the sample survey is meant to represent. It is for this reason that statistics produced from a sample are referred to as "estimates": they estimate what the actual statistics are for the entire population, or for any subgroup in the population.

6.2.1 Sampling Error

Sampling error is a purely statistical phenomenon, resulting from the fact that the data are collected from a sample that represents the entire population, rather than from everyone in the population, as in the case of a census. Sampling "error" is a technical term; it does not refer to any known error, but rather to the fact that an estimate produced from a sample has some amount of uncertainty associated with it.

It is possible to quantify the uncertainty of an estimate produced from the survey sample data, to the extent that the uncertainty is caused by the use of sample with a known probability of being selected for the survey. There is no one number that can be assigned to every survey statistic to indicate the uncertainty; rather, it depends on the type of statistic (percentage, mean, ratio, difference, etc.), the size of the sample used to calculate the estimate, and the effects of complex sampling designs such as those used for MATS.

Common measures of uncertainty include standard errors and confidence intervals. The MATS technical reports utilize confidence intervals, which express the likely range of the actual value of a population statistic, around the "point" estimate produced from the survey data. For example, the statement that MATS 2014 found the 2014 smoking prevalence among adult Minnesotans to be 14.4±1.0 percent means the expectation is that the true value falls somewhere within the confidence interval ranging from 13.1 percent to 15.1 percent. The confidence interval is commonly expressed as a "half-width," plus or minus around the point estimate, as in this smoking prevalence example. Like nearly all sample surveys, MATS reports the 95 percent confidence interval, which means that there is a 95 percent certainty that the interval for any given estimate contains the true value.

All statistics presented in the MATS technical reports use weighted data. The survey weights reflect the complex MATS 2014 sample design, as described in Chapter 5. This means that the reported statistics are reflective of the entire population or subgroup for which they are calculated. The weighted estimates for the MATS 2014 technical report and their associated confidence intervals were all calculated using SAS, a widely used statistical software package that accounts for the complex sample design and sample weights.

6.2.2 Potential Sources of Nonsampling Error

As in the case of sampling error, it is nearly impossible for a survey to avoid other sources of error. Unlike sampling error, it is not typically possible to quantify potential nonsampling errors in a specific survey.

6.2.2.1 Coverage Issues

In addition to the sampling error that is common to all sample surveys, MATS 2014 was also subject to a form of nonsampling error known as coverage error. All survey samples use a "frame" from which to draw the sample. Ideally, the frame "covers" the same population about which the survey seeks to provide information, but frames seldom perfectly cover the population. Those in the population who are not covered by the frame may be different from those who are covered by it, in terms of the characteristics, behaviors, attitudes, and beliefs that the survey addresses. The greater this difference is (if any), the greater the likelihood that there is some error in the reported statistics, in terms of their ability to accurately reflect the entire population of interest.

While the number of people without landline phones has been increasing steadily, MATS began sampling cell phones in MATS 2010. However, the cell phone RDD sample only selected numbers with area codes and exchanges in Minnesota. Minnesota residents who only have a cell phone with an out-of-state area code were not covered by the MATS 2014 sample design because this would have required a nationwide sample of cell phones where very few would be found to live in Minnesota. Unfortunately, there is no way to accurately estimate the extent of this coverage error.

An estimated 1.4 percent of Minnesota residents have neither a landline nor a cell phone[7], meaning that coverage error due to the sample frame for MATS 2014 is minimal. As with previous MATS efforts, MATS 2014 was conducted in English only. While the vast majority of Minnesota residents speak English to some degree, U.S. Census data estimate that 5.2 percent of Minnesotans do not speak English at all (2011

[7] Blumberg S.J., Ganesh, N., Luke, J.V., and Gonzales, G. Wireless substitution: state-level estimates from the National Health Interview Survey, 2012. National Center for Health Statistics.

American Community Survey). These non-English speakers were excluded by the design of MATS 2014 and are thus another source of coverage error.

6.2.2.2 Measurement Error

Nonsampling errors in surveys may be attributed to a variety of sources, many of which fall under the type called measurement error. These sources of potential error may result from how the survey was designed, how respondents interpret questions, how able and willing respondents are to provide correct answers, and how accurately the answers are recorded and processed. MATS 2014 took several steps to minimize these types of errors. Important ones for MATS 2014, as described throughout this methodology report, include the careful and deliberate design of the questionnaire with review by multiple individuals and organizations; continuing improvement to the clarity of several questions, balanced against possible effects on comparability of the responses across survey rounds; the use of a CATI system to administer the questionnaire and record responses; the internal testing of the CATI questionnaire; the pilot test of the instrument and survey procedures; the monitoring of the sample and of the collected data throughout data collection; and the thorough review of that data prior to finalizing the file for analysis.

The weighting process – especially the raking/post-stratification adjustments – partially corrects for bias due to minor discrepancies in the representativeness of the sample. During the weighting process, extensive diagnostic examination of the effects of the weighting design and of draft weights on the weighted estimates of demographics, smoking prevalence, and other characteristics further supported the "calibration" of the sample into closer conformity with the overall Minnesota population. Biases may be present when people who are missed in the survey differ from those interviewed in ways other than the categories used in weighting. People who are missed in the survey include those missed because of the frame coverage issue or because sampled individuals did not respond to the survey. As with most surveys that rely on telephone interviewing, it is likely that some subgroups, such as specific racial and ethnic minority communities, are under-represented; again, the use of race/ethnicity in the raking process helps reduce this effect.

All of these considerations affect comparisons across different surveys or data sources. Although most of these limitations are inherent in all surveys, MATS 2014 made every effort to minimize these limitations.

All the changes from the MATS 2010 methodology were due to the regional-based sample design for the MATS 2014 and the interest in obtaining regional estimates. First, the basic design weights were calculated by sampling stratum to account for the differential sampling rates in the eight geographic regions such that the estimates would be design unbiased. Second, the region sampling stratum was used to form nonresponse adjustment cells during screener nonresponse adjustment because there were noticeable differences in the response propensity across different strata. Third, a new raking dimension "region" (based on respondent self-reported information) was added to improve the face value of the survey without introducing any significant changes on the state-level estimate. Sensitivity analysis was conducted to ensure that the state-level estimates would not be shifted significantly by this new raking dimension, either overall or by demographic characteristics. Finally, weight trimming to reduce the impact of large weights on variance was conducted at the region level. In particular, the cutoff thresholds at which the weights were trimmed were determined by region because the basic design weights varied across the sampling regions due to differential sampling rates.

In summary, the goal of the MATS 2014 weighting was to yield unbiased state-level and regional estimates without significantly inflating the variance of the estimates at either state or region level. The weighting approach was chosen to maintain the comparability between the MATS 2010 and MATS 2014 estimates to the greatest extent possible.

Appendix A

MATS 2014 Questionnaire

SECTION A: INTRO, CONSENT, AND INITIAL DEMOGRAPHIC ITEMS

BOX A1

IF CELL PHONE CASE, INSERT STATEMENT IN BRACKETS.

A1. Hello, may I speak with {FIRST NAME}?

My name is {INTERVIEWER NAME} and I am calling on behalf of the Minnesota Department of Health.

[IF CELL: If you are currently driving a car or doing any activity that requires your full attention, I need to call you back at a later time.]

A2. We are conducting general health interviews with Minnesota residents. You have been randomly chosen to be interviewed about attitudes and behaviors related to health and tobacco use. Your responses will represent thousands of other Minnesotans and will be used to help all Minnesotans live healthier lives. Your input is very important for the results to be accurate.

The interview is completely voluntary. You don't have to answer any question you don't want to, and you can end the interview at any time. The interview generally takes about 15 minutes, depending on your answers. Any information you give will be held confidential to the fullest extent of the law.

[IF NEEDED: THE WESTAT TOLL FREE NUMBER IS **1-855-819-2365**]

BOX A5

IN A5, ALLOW RESPONSES OF 18 – 110, -7 AND -8.
HARD RANGE IS 18-110; SOFT RANGE IS 18-85.

A5. Before we begin, I need to put your age into the computer. The computer will then skip questions that are not relevant to your age group. What is your age?

_____ YEARS OLD

BOX A6

IF A VALID AGE IS ENTERED IN A5, GO TO A7. ELSE CONTINUE WITH A6 TO COLLECT AGE RANGE.

IF A5 ≠ MISSING SKIP TO A7, ELSE CONTINUE WITH A6.

A6. If it's okay, I would like to record the range in which your age falls. Are you…

18 to 24,	1
25 to 29,	2
30 to 34,	3
35 to 44,	4
45 to 54,	5
55 to 64, or	6
65 or older	7
REFUSED	-7
DON'T KNOW	-8

BOX A6 END BOX

IF NO AGE OR AGE RANGE RECORDED IN A5 AND A6, CODE INTERVIEW AS A REFUSAL AND GO TO THANK SCREEN.

IF A6 = -7 OR -8, ASSIGN CASE RESULT CODE = 2 (REFUSAL) AND GO TO THANK SCREEN.

BOX A7

ALLOW 1, -7. -8, AND ALPHABETIC VALUES IN A7L.

IF A7L = 1, SKIP TO WRGST (RESPONDENT DOES NOT LIVE IN MINNESOTA).

IF LETTER ENTERED IN A7L, GO TO COUNTY LOOKUP TABLE AND DISPLAY ALL COUNTIES BEGINNING WITH THE LETTER ENTERED, ALONG WITH THEIR RESPECTIVE ALPHABETICAL SEQUENCE NUMBER, 1-87.

IF A7L = -7 OR -8, RECORD THE SAME VALUE IN A7.

ALLOW INTERVIEWER TO ENTER COUNTY ALPHABETICAL SEQUENCE NUMBER BETWEEN 1 – 87 IN A7.

DELIVERY FILE WILL MATCH FIPS CODE TO COUNTY SELECTED AND WILL DELIVER COUNTY NAME AND FIPS CODE.

A7. What Minnesota county do you live in?

_____ ENTER FIRST LETTER OF COUNTY NAME

R DOES NOT LIVE IN MINNESOTA	1	**SKIP TO WRGST**
REFUSED	-7	
DON'T KNOW	-8	

_____ ENTER COUNTY NUMBER

A8. What is your zip code?

|__|__|__|__|__| ENTER ZIP CODE

J14. INDICATE SEX OF RESPONDENT. ASK ONLY IF NECESSARY

MALE	1
FEMALE	2
REF	-7
DK	-8

SECTION B: GENERAL HEALTH

B1. Now I have a few questions about your health. In general, would you say that your health is…

Excellent,	1
Very good,	2
Good,	3
Fair, or	4
Poor?	5
REF	-7
DK	-8

SECTION D: CIGARETTE SMOKING

D1. D1. Have you ever smoked a cigarette, even 1 or 2 puffs?

YES	1	
NO	2	SKIP TO BOX D7
REF	-7	SKIP TO BOX D7
DK/NOT SURE	-8	SKIP TO BOX D7

D2. D2. Do you consider yourself a smoker?

YES	1
NO	2
REF	-7
DK/NOT SURE	-8

D3. Have you smoked at least 100 cigarettes in your entire life?

YES	1	
NO	2	SKIP TO BOX D6
REF	-7	SKIP TO BOX D6
DK/NOT SURE	-8	SKIP TO BOX D6

D4. Do you now smoke cigarettes every day, some days, or not at all?

EVERY DAY	1	
SOME DAYS	2	SKIP TO BOX D6
NOT AT ALL	3	SKIP TO BOX D6
REF	-7	SKIP TO BOX D7
DK	-8	SKIP TO BOX D7

BOX D5

IN D5, HARD RANGE IS 0 – 99, SOFT RANGE IS 0 – 40.

D5. On average, about how many cigarettes per day do you smoke?

|__|__| ENTER NUMBER OF CIGARETTES

REF -7

DK/NOT SURE -8

BOX D6

IF D4 = 1, SKIP TO BOX D7.

DISPLAY INSTRUCTION:
IF D4 = 3, USE FIRST DISPLAY IN D6, ELSE USE SECOND DISPLAY

IN D6 ALLOW RESPONSES OF 0-30, -7 AND -8.

D6. {Just to be clear about what you just said, during/During} the past 30 days, on how many days did you smoke cigarettes?

|__|__| ENTER NUMBER OF DAYS

NONE

REF -7

DK/NOT SURE -8

BOX D7SMOKING STATUS BOX

DEFINITIONS OF SMOKING STATUS GROUPS:

C1 IS A CURRENT ESTABLISHED, DAILY SMOKER [SMOKED AT LEAST 100 CIGS AND SMOKES EVERY DAY].

C2 IS A CURRENT ESTABLISHED, SOME DAYS BUT NOT IN PAST 30 DAYS, SMOKER [SMOKED AT LEAST 100 CIGS, SMOKES ON SOME DAYS, BUT NOT IN PAST 30 DAYS INCLUDING REF & DK].

C3 IS A CURRENT ESTABLISHED, SOME DAYS WHO HAS SMOKED AT LEAST 1 DAY IN PAST 30 DAYS, SMOKER [SMOKED AT LEAST 100 CIGS, SMOKES ON SOME DAYS, AND HAS SMOKED IN PAST 30 DAYS].

F1 IS A FORMER ESTABLISHED SMOKER, NOT AT ALL AND NOT IN THE PAST 30 DAYS, SMOKER [SMOKED AT LEAST 100 CIGS, DOES NOT SMOKE AT ALL NOW AND HAS NOT SMOKED IN PAST 30 DAYS (INCLUDING REF & DK)].

F2 IS A FORMER ESTABLISHED SMOKER, NOT AT ALL, WHO HAS SMOKED IN THE PAST 30 DAYS, SMOKER [SMOKED AT LEAST 100 CIGS, DOES NOT SMOKE AT ALL NOW AND HAS SMOKED IN PAST 30 DAYS].

X1 IS A CURRENT EXPERIMENTER WHO HAS SMOKED IN THE PAST 30 DAYS [HAS NOT SMOKED AT LEAST 100 CIGS BUT HAS SMOKED IN PAST 30 DAYS].

X2 IS A CURRENT EXPERIMENTER WHO HAS NOT SMOKED IN THE PAST 30 DAYS [HAS NOT SMOKED AT LEAST 100 CIGS, HAS NOT SMOKED IN PAST 30 DAYS (INCLUDING REF & DK), BUT HAS SMOKED AT LEAST A PUFF].

NS IS A NEVER SMOKER [HAS NOT SMOKED EVEN A PUFF].

CREATE SSTAT (SMOKING STATUS GROUPS) HERE:

IF D3 = 1 AND D4 = 1, SSTAT = C1.
IF D3 = 1 AND D4 = 2 AND D6 = 0, -7 OR -8, SSTAT = C2.
IF D3 = 1 AND D4 = 2 AND D6 > 0, SSTAT = C3.
IF D3 = 1 AND D4 = 3 AND D6 = 0, -7 OR -8, SSTAT = F1.
IF D3 = 1 AND D4 = 3 AND D6 > 0, SSTAT = F2.
IF D3 = 2, -7 OR -8 AND D6 > 0. SSTAT = X1.
IF D3 = 2, -7 OR -8 AND D6 = 0, -7 OR -8, SSTAT = X2.
IF D1 = 2, -7 OR -8 OR IF D4 = -7 OR -8, SSTAT = NS.

DESCRIPTIVE NOTE: D7 is asked of anyone who has smoked in the past 30 days and is not a current daily (every day) smoker (SSTAT = C3, F2, or X1).

CURRENT DAILY SMOKERS (SSTAT = C1), AND CURRENT, FORMER, AND EXPERIMENTAL SMOKERS WHO HAVE NOT SMOKED IN THE PAST 30 DAYS (SSTAT = C2, F1, X2), AND NEVER SMOKERS (SSTAT = NS) SKIP D7, AS FOLLOWS:

IF SSTAT = NS, SKIP TO D32A
ELSE IF SSTAT = C1, C2, F1, or X2, SKIP TO BOX D8

IN D7, HARD RANGE IS 1 – 99, SOFT RANGE IS 1 – 40.

D7. During the past 30 days, *on the days when you smoked*, about how many cigarettes did you smoke on average?

|__|__| ENTER NUMBER OF CIGARETTES

REF	-7
DK/NOT SURE	-8

BOX D8

DESCRIPTIVE NOTE: ASK D8 OF ALL CURRENT SMOKERS (SSTAT = C1, C2, OR C3), FORMER SMOKERS WHO HAVE SMOKED IN THE PAST 30 DAYS (SSTAT = F2), AND EXPERIMENTERS WHO HAVE SMOKED IN THE PAST 30 DAYS (SSTAT = X1):

IF SSTAT = F1 OR X2, SKIP TO BOX D9

NOTE: NEVER SMOKERS (SSTAT = NS) SKIPPED TO D32A FROM BOX D7.

DISPLAY INSTRUCTION:
IF SSTAT = C1, USE THE FIRST DISPLAY IN D8, ELSE USE SECOND DISPLAY.

D8. {How/On the days that you smoke, how} soon after you wake up do you smoke your first cigarette? Would you say…

Within 5 minutes,	1
6-30 minutes,	2
31-60 minutes, or	3
After 60 minutes?	4
REF	-7
DK/NOT SURE	-8

BOX D9

PROGRAMMER CHECK NOTE: PREVIOUS FLOW AND SKIP PATTERNS BRING ALL SMOKING STATUSES TO D9 EXCEPT NEVER SMOKERS (NS).

D9 AGE CHECK:
AGE WHEN RESPONDENT FIRST SMOKED A CIGARETTE (D9) CAN NOT BE GREATER THAN HIS/HER CURRENT AGE (A5 OR A6).
IF D 9 > A5 OR
IF D9 > [UPPER END OF A6 AGE RANGE CATEGORY],
TRIGGER AGE CHECK FAILURE VERIFICATION SCREEN:
"I have your age recorded as {A5/A6 RANGE LABEL}. Is that correct?" Y/N
"And again, how old were you the first time you smoked a cigarette, even one or two puffs?" [STORE NEW RESPONSE IN D9 AND OLD RESPONSE IN D9OLD. DO NOT IMPOSE AGE CHECK UPON SECOND ENTRY.]

IN D9 HARD IS RANGE 0 – 110, SOFT RANGE IS 10 – 50.

D9. How old were you the first time you smoked a cigarette, even one or two puffs?

|__|__|__| ENTER AGE IN YEARS

REF -7

DK/NOT SURE -8

BOX D10

DESCRIPTIVE NOTE: ASK D10 OF ALL SMOKING STATUSES EXCEPT EXPERIMENTERS WHO HAVE NOT SMOKED IN THE PAST 30 DAYS (SSTAT = X2) AND NEVER SMOKERS (SSTAT = NS).

IF SSTAT = X2, SKIP TO BOX D15

[PROGRAMMER NOTE: SSTAT = NS ALREADY SKIPPED FROM BOX D7 TO D32A.]

D10 AGE CHECK:

AGE WHEN RESPONDENT FIRST STARTED SMOKING CIGARETTES REGULARLY (D10) CAN NOT BE GREATER THAN HIS/HER CURRENT AGE (A5 OR A6).
IF D 10 > A5 OR
IF D10 > [UPPER END OF A6 AGE RANGE CATEGORY],
TRIGGER AGE CHECK FAILURE VERIFICATION SCREEN:
"I have your age recorded as {A5/A6 RANGE LABEL}. Is that correct?" Y/N
"And again, how old were you
when you first started smoking cigarettes regularly?" [STORE NEW RESPONSE IN D10 AND OLD RESPONSE IN D10OLD. DO NOT IMPOSE AGE CHECK UPON SECOND ENTRY.]
IN D10 HARD IS RANGE 0 – 110, SOFT RANGE IS 10 – 50. ALSO ALLOW 999.

D10. How old were you when you first started smoking cigarettes regularly?

[IF NEVER SMOKED REGULARLY ENTER 999]

|__|__|__| ENTER AGE IN YEARS

NEVER SMOKED REGULARLY

REF -7

DK/NOT SURE -8

BOX D11

DESCRIPTIVE NOTE: DAILY SMOKERS (SSTAT = C1) AND EXPERIMENTERS WHO HAVE NOT SMOKED IN THE PAST 30 DAYS (SSTAT = X2) SKIP TO BOX D15.

[PROGRAMMER NOTE: NEVER SMOKERS (SSTAT = NS) ARE ALREADY SKIPPED FROM BOX D7 TO D32A.]

IF SSTAT = C1 OR X2, SKIP TO BOX D15

D11. Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?

YES	1	
NO	2	SKIP TO BOX D15
REF	-7	SKIP TO BOX D15
DK/NOT SURE	-8	SKIP TO BOX D15

BOX D12

DESCRIPTIVE NOTE: ASK D12 TO:
(ALL FORMER SMOKERS WHO HAVE NOT SMOKED IN THE PAST 30 DAYS ([SSTAT = F1]), AND
((FORMER SMOKERS WHO HAVE SMOKED IN THE PAST 30 DAYS [SSTAT = F2] AND CURRENT EXPERIMENTERS WHO HAVE SMOKED IN THE PAST 30 DAYS [SSTAT = X1]) WHO DID NOT EXPLICITY REPORT THAT THEY NEVER SMOKED REGULARLY [i.e., D10 ≠ 999]).

[PROGRAMMER NOTE: C1, X2, AND NS SKIPPED D12 FROM PREVIOUS BOXES.]

IF (SSTAT = C2 OR C3) OR ((SSTAT = F2 OR X1) AND D10 = 999) SKIP TO BOX D15.

IN D12, IF UNIT = 1 ALLOW 1-90; IF UNIT = 2 ALLOW 1-104; IF UNIT = 3 ALLOW 1-48; IF UNIT = 4 ALLOW 1-50.

D12. About how long has it been since you last smoked cigarettes regularly?

[IF NEEDED: "Regularly" is whatever that means to you.]
[IF NEVER SMOKED REGULARLY ENTER 999]

|__|__|__| ENTER UNIT

|__|__| ENTER NUMBER

DAYS	1	SKIP TO BOX D15
WEEKS	2	SKIP TO BOX D15
MONTHS	3	SKIP TO BOX D15
YEARS	4	SKIP TO BOX D15
NEVER	999	SKIP TO BOX D15
REF	-7	
DK	-8	

BOX D13a

ASK D13a ONLY OF THOSE WHO ANSWERED -7 (REFUSED) OR -8 (DON'T KNOW) TO D12.

SKIP OUT OF D13a THROUGH h SEQUENCE WHEN THE FIRST "YES" (1) RESPONSE IS GIVEN. IF D13h IS ASKED AND THERE IS NOT A "YES" RESPONSE TO D13h, CONTINUE TO BOX D15.

D13. Would you say the last time you smoked cigarettes regularly was…

[IF NEEDED:"REGULARLY" IS WHATEVER "REGULARLY" MEANS TO THE RESPONDENT]

		YES	NO	REF	DK	
a.	10 or more years ago?	1	2	-7	-8	IF D13a = 1 SKIP TO BOX D15
b.	More than 5 years ago, but less than 10 years ago?	1	2	-7	-8	IF D13b = 1 SKIP TO BOX D15
c.	More than 2 years ago, but less than 5 years ago?	1	2	-7	-8	IF D13c = 1 SKIP TO BOX D15
d.	More than 1 year ago, but less than 2 years ago?	1	2	-7	-8	IF D13d = 1 SKIP TO BOX D15
e.	More than 6 months ago, but less than 1 year ago?	1	2	-7	-8	IF D13e = 1 SKIP TO BOX D15
f.	More than 3 months ago, but less than 6 months ago?	1	2	-7	-8	IF D13f = 1 SKIP TO BOX D15
g.	More than 1 month ago, but less than 3 months ago?	1	2	-7	-8	IF D13g = 1 SKIP TO BOX D15
h.	Less than 1 month ago?	1	2	-7	-8	

BOX D15

DESCRIPTIVE NOTE: ASK D15 TO CURRENT SMOKERS (SSTAT = C1, C2, OR C3) , FORMER ESTABLISHED SMOKERS WHO HAVE SMOKED IN THE LAST 30 DAYS (SSTAT = F2), AND CURRENT EXPERIMENTERS WHO HAVE SMOKED IN THE LAST 30 DAYS (SSTAT = X1).

IF SSTAT = F1, X2, OR NS, SKIP TO D32A

DISPLAY INSTRUCTION:
IF SSTAT = F2 USE SECOND DISPLAY IN D15, ELSE USE FIRST.

D15. {Do/Did} you usually buy your cigarettes…

In Minnesota,	1
Out of state,	2
On an American Indian Reservation,	3
Over the internet,	4
Through mail order, or	5
Through an 800 number?	6
HAVE NOT BOUGHT ANY CIGARETTES IN PAST 12 MONTHS	7 SKIP TO D30
REF	-7
DK	-8

IF THEY SAY THEY DON'T USUALLY BUY THEIR OWN CIGARETTES, ASK BEFORE CODING: Just to confirm, you have not bought any cigarettes for yourself in the past 12 months, is that correct?

IF THEY HAVE BOUGHT CIGARETTES, RE-READ THE QUESTION AND SELECT ONE OF THE CHOICES 1-6; OTHERWISE, USE CHOICE 7.

D42. The last time you bought cigarettes for yourself, did you buy them by the pack or by the carton?

BY THE PACK	1	
BY THE CARTON	2	SKIP TO D44
OTHER (SPECIFY)	3	SKIP TO D45
REF	-7	SKIP TO D45
DK	-8	SKIP TO D45

D43. What price did you pay for the last pack of cigarettes you bought?

|__|__|__|	ENTER COST		SKIP TO D45
	REF	-7	SKIP TO D45
	DK	-8	SKIP TO D45

D44. What price did you pay for the last carton of cigarettes you bought?

|__|__|__| ENTER COST

REF	-7
DK	-8

D45. The last time you bought cigarettes, did you take advantage of coupons, rebates, buy 1 get 1 free, 2 for 1, or any other special promotions for cigarettes?

YES	1
NO	2
REF	-7
DK/NOT SURE	-8

D31. In the past 12 months, how often have you done any of the following things to try and save money on cigarettes?

Would you say often, sometimes, or not at all in the past 12 months?

		OFTEN	SOMETIMES	NOT AT ALL	REF	DK
a.	Bought a cheaper brand of cigarettes?	4	3	2	-7	-8
b.	Rolled your own cigarettes?	4	3	2	-7	-8
c.	Used another form of tobacco other than cigarettes?	4	3	2	-7	-8
d.	Used coupons, rebates, buy 1 get 1 free, or any other special promotions?	4	3	2	-7	-8
e.	Purchased cartons instead of individual packs?	4	3	2	-7	-8
f.	Found less expensive places to buy cigarettes?	4	3	2	-7	-8
g.	Smoked fewer cigarettes	4	3	2	-7	-8
h.	Shared fewer cigarettes with others	4	3	2	-7	-8
i.	Saved half a cigarette to finish smoking later	4	3	2	-7	-8
j.	Anything else?	4	3	2	-7	-8

D31OS. IF YES TO D31j: What is the other thing you've done to try and save money on cigarettes?

_____ (VERBATIM TEXT)

REFUSED	-7
DON'T KNOW	-8

D30. Is your usual cigarette brand menthol or non-menthol?

MENTHOL	1	
NONMENTHOL	2	SKIP TO D32A
NO USUAL BRAND	3	SKIP TO D32A
REFUSED	-7	SKIP TO D32A
DON'T KNOW	-8	SKIP TO D32A

D33. If menthol cigarettes were no longer sold in U.S. stores, would you quit smoking?

YES	1	SKIP TO D32A
NO	2	
REFUSED	-7	SKIP TO D32A
DK/NOT SURE	-8	SKIP TO D32A

D34. Which of the following would you be most likely to do if menthol cigarettes were no longer sold in U.S. stores? Would you…

Switch to non-menthol cigarettes,	1
Switch to some other non-menthol tobacco product,	2
Switch to menthol electroniccigarettes [IF NEEDED: Electronic cigarettes, or e-cigarettes, look like regular cigarettes, but are battery-powered and produce vapor instead of smoke]	3
Switch to some other menthol tobacco product,	4
Buy menthol cigarettes online, or	5
Buy menthol cigarettes from another country.	6
REFUSED	-7
DK	-8

D32A. Have you ever used a hookah water pipe?

IF NEEDED]: A HOOKAH IS ALSO KNOWN AS A SHISHA (ARABIC) OR NARGILA (TURKISH). A HOOKAH OR WATER PIPE IS A DEVICE FOR SMOKING THAT USES WATER TO COOL AND MOISTEN THE SMOKE. IT IS OFTEN MADE OF GLASS. IT SOMETIMES HAS SEVERAL MOUTHPIECES, SO THAT PEOPLE CAN SHARE IT.

YES	1	
NO	2	SKIP TO D32B
REF	-7	SKIP TO D32B
DK	-8	SKIP TO D32B

D33A. During the past 30 days, how many days did you use a hookah water pipe?

|__|__| ENTER NUMBER OF DAYS

REF	-7
DK	-8

E-CIGARETTES

D32B. The next questions are about electronic cigarettes, often called e-cigarettes. E-cigarettes look like regular cigarettes, but are battery-powered and produce vapor instead of smoke.

Have you ever used an electronic cigarette even just one time in your entire life?

YES	1	
NO	2	SKIP TO BOX D18
REF	-7	SKIP TO BOX D18
DK	-8	SKIP TO BOX D18

D33B. During the past 30 days, on how many days did you use e-cigarettes?

|__|__| ENTER NUMBER OF DAYS

REF	-7
DK	-8

BOX D38
IF D33B = -7, or -8, SKIP TO BOX D18

ELSE IF D33B=0, USE "you have used" IN D38 DISPLAY
ELSE IF D33B>0 USE "you use" in D38 DISPLAY.

D38. Next I'm going to read you a list of common reasons people use e-cigarettes. For each, please tell me whether or not it's a reason {you have used/you use} e-cigarettes.

[RANDOMIZE ORDER OF QUESTIONS]

	YES	NO	DK/NOT SURE	REF
a. {You have used/You use} e-cigarettes to quit other tobacco products	1	2	-8	-7
b. {You have used/You use} e-cigarettes to cut down on other tobacco products	1	2	-8	-7
c. {You have used/You use} them because they are affordable	1	2	-8	-7
d. {You have used/You use} them because they come in menthol flavor	1	2	-8	-7
e. {You have used/You use} them because they come in flavors other than menthol	1	2	-8	-7
f. {You have used/You use} them in places other tobacco products are not allowed	1	2	-8	-7
g. {You have used/You use} them because you were curious about e-cigarettes	1	2	-8	-7
h. {You have used/You use} them because you think they might be less harmful than other tobacco products	1	2	-8	-7
i. {You have used/You use} e-cigarettes for some other reason	1	2	-8	-7

D38OS. IF YES TO (D38i): What is the other reason you use/have used e-cigarettes?

_____ (VERBATIM TEXT)

REFUSED	-7
DON'T KNOW	-8

D39.
When you first used e-cigarettes, did you use e-cigarettes flavored to taste like menthol, spice, candy, fruit, alcohol, or any other flavor?

YES	1
NO	2
REF	-7
DK	-8

BOX D40

IF D33B = 0 or -7 or -8, SKIP TO BOX D18

D40. Which of the following describes your usual e-cigarette? Is It….

Regular flavor,	1
Menthol,	2
Some other flavor, or	3
You don't have a usual flavor?	4
REFUSED	-7
DK/NOT SURE	-8

BOX D18

DESCRIPTIVE NOTE: D18, D20, D22 ARE ASKED OF ALL RESPONDENTS.

D18. Now I have a few questions about pipes and cigars. Have you smoked tobacco in a pipe at least 20 times in your life?

YES	1	
NO	2	SKIP TO D20
REF	-7	SKIP TO D20
DK/NOT SURE	-8	SKIP TO D20

BOX D19

IN D19, D21, AND D23, ALLOW RESPONSES OF 0-30, -7 AND -8.

D19. During the past 30 days, on how many days did you smoke tobacco in a pipe?

|__|__| ENTER NUMBER OF DAYS

REF	-7
DK/NOT SURE	-8

D20. Have you smoked cigars, cigarillos, or little filtered cigars that look like cigarettes, at least 20 times in your life?

YES	1	
NO	2	SKIP TO D22
REF	-7	SKIP TO D22
DK/NOT SURE	-8	SKIP TO D22

D21. During the past 30 days, how many days did you smoke cigars, cigarillos or little filtered cigars that look like cigarettes?

|__|__| ENTER NUMBER OF DAYS

REF	-7
DK/NOT SURE	-8

D22. Have you used any kind of smokeless tobacco such as chewing tobacco, snuff, or snus at least 20 times in your life?

YES	1	
NO	2	SKIP TO BOX E1
REF	-7	SKIP TO BOX E1
DK/NOT SURE	-8	SKIP TO BOX E1

D23. During the past 30 days, how many days did you use any kind of smokeless tobacco?

|__|__| ENTER NUMBER OF DAYS

REF	-7
DK/NOT SURE	-8

SECTION E: SMOKING CESSATION

Quit Attempts

BOX E1

DESCRIPTIVE NOTE: ASK C1 TO:
ALL CURRENT SMOKERS (SSTAT = C1, C2, C3) AND OTHERS WHO SMOKED REGULARLY WITHIN THE PAST YEAR;
FORMER SMOKERS WHO SMOKED IN PAST 30 DAYS (SSTAT = F2);
CURRENT EXPERIMENTERS WHO SMOKED IN THE PAST 30 DAYS (SSTAT = X1) ;
AND FORMER SMOKERS WHO HAVE NOT SMOKED IN THE PAST 30 DAYS (SSTAT = F1) BUT SMOKED REGULARLY WITHIN THE PAST YEAR (BASED ON RESPONSES TO D12/D13)

PROGRAMMER NOTE: FOR USE IN BOXES E1, E4, G3, AND H36, FIRST REPROCESS D12 INTO A STANDARD MEASURE EQUIVALENT TO YEARS (D12YR)

IF D10 = 999 OR IF D12 = 999, D12YR = 99.9 [NEVER SMOKED REGULARLY]
ELSE IF D12 = -7 OR -8, OR SKIPPED [BLANK], D12YR = -9 [NOT ASCERTAINED]
ELSE DERIVE YEAR EQUIVALENT: DIVIDE D12 NUMBER BY 365/52/12/1 FOR D12 UNIT = 1 (DAYS)/2 (WEEKS)/3 (MONTHS)/ 4 (YEARS), RESPECTIVELY. CARRY OUT CALCULATION TO ONE DECIMAL PLACE

IF (SSTAT = X2 OR NS) OR (SSTAT = F1 AND ((1 < D12YR ≤ 99.9) OR (D13a = 1 OR D13b = 1 OR D13c = 1 OR D13d = 1) [i.e., LAST SMOKED REGULARLY MORE THAN ONE YEAR AGO]))), SKIP TO BOX E4.

NOTE: FOR THE FORMER SMOKERS WHO HAVE NOT SMOKED IN THE PAST 30 DAYS (SSTAT = F1), C1 WILL BE ASKEDTOTHOSE WHO REPORTED IN D12 THAT THEY NEVER SMOKED REGULARLY BUT C1 WILL NOT BE ASKED TO THOSE WHO DID NOT SMOKE REGULARLY WITHIN THE PAST YEAR, BASED ON YEARS REPORTED IN D12 OR RELEVANT QUESTIONS IN D13.

C1. Around this time 12 months ago, were you smoking cigarettes every day, some days, or not at all?

EVERY DAY	1
SOME DAYS	2
NOT AT ALL	3
REFUSED	-7
DK/NOT SURE	-8

E1. During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?

YES	1	
NO	2	SKIP TO BOX E4
REF	-7	SKIP TO BOX E4
DK	-8	SKIP TO BOX E4

C8. When was the start date of your most recent quit attempt that lasted for one day or longer?

IF RESPONDENT DOES NOT KNOW EXACT DATE: Can you tell me just the month and year?

|__|__|	MONTH
|__|__|	DAY
|__|__|__|__|	YEAR [RANGE IS 2013-2014]
REF	-7
DK	-8

C9. How long did you actually stay off cigarettes during that quit attempt?

|__|__|__| DAYS/WEEKS/MONTHS
REF -7
DK -8

[RANGES ARE 1-365 DAYS; 1-52 WEEKS; 1-12 MONTHS]

BOX E2

IN E2, HARD RANGE IS 1 – 99, SOFT RANGE IS 1 – 9.

E2. How many times in the past 12 months did you try to quit smoking?
[PROBE AS NEEDED: Your best guess is fine.]

|__|__| ENTER NUMBER OF TIMES

REF	-7
DK/NOT SURE	-8

Methods of Quitting

BOX E4

DESCRIPTIVE NOTE: ASK E4, E4F, AND E20 TO:
CURRENT SMOKERS WHO HAVE TRIED TO QUIT DURING THE PAST 12 MONTHS (SSTAT = (C1, C2 OR C3) AND E1 = 1) AND
FORMER SMOKERS (SSTAT = F1 OR F2) WHO QUIT IN THE PAST 10 YEARS, LOOSELY DEFINED AS THOSE WHO LAST SMOKED REGULARLY WITHIN THE PAST 10 YEARS (D12YR ≤ 10 YEARS OR D13b = 1 OR D13c = 1 OR D13d = 1 OR D13e = 1 OR D13f = 1 OR D13g = 1 OR D13h = 1)).
PROGRAMMER NOTE: FOR THE FOLLOWING INSTRUCTION, USE D12YR CALCULATED IN BOX E1.

IF ((SSTAT = C1 OR C2 OR C3) AND E1 ≠ 1)
OR ((SSTAT = F1 OR F2) AND ((10 < D12YR ≤ 99.9) OR D13a = 1)
OR (SSTAT = X1 OR X2 OR NS), SKIP TO BOX E19.

NOTE: FOR THE FORMER SMOKERS (SSTAT = F1 OR F2), THIS SKIP WILL EXCLUDE THOSE WHO REPORTED IN D10 OR D12 THAT THEY NEVER SMOKED REGULARLY AND THOSE WHO DID NOT SMOKE REGULARLY WITHIN THE PAST 10 YEARS, BASED ON YEARS REPORTED IN D12 OR RELEVANT QUESTIONS IN D13.

DISPLAY INSTRUCTION: IF SSTAT = F1 OR F2 (FORMER SMOKER), USE FIRST DISPLAY IN E4, E4F, E20, AND E4G, ELSE USE THE SECOND DISPLAY.

E4. {When you quit smoking/The last time you tried to quit smoking} did you use **any** of the following products – a nicotine patch or gum, a nicotine lozenge or a nicotine nasal spray or inhaler?

YES	1
NO	2
REF	-7
DK	-8

E4f. {When you quit smoking/The last time you tried to quit smoking} did you use a prescription medication like Zyban, Wellbutrin, or Chantix to help you quit smoking?

YES	1
NO	2
REF	-7
DK	-8

E20. {When you quit smoking for good/The last time you tried to quit smoking} did you use a stop-smoking clinic or class, a quit-smoking telephone help line, a one-on-one counseling from any doctor, or other health professional, or an on-line or web-based counseling service?

YES	1
NO	2
REF	-7
DK	-8

BOX E4G
ASK E4g ONLY IF THEY HAVE EVER USED E-CIGARETTES (D32B=YES); ELSE SKIP TO BOX E19

E4g. {When you quit smoking for good/The last time you tried to quit smoking} did you use e-cigarettes to help you quit?

YES 1
NO 2
REF -7
DK -8

SMOKING ATTITUDES & BELIEFS

BOX E19
DESCRIPTIVE NOTE: ASK E19 TO CURRENT SMOKERS (SSTAT = C1, C2, C3) AND FORMER SMOKERS WHO HAVE SMOKED IN THE PAST 30 DAYS (SSTAT = F2).

IF SSTAT = F1, X1, X2, OR NS, SKIP TO G1

E19. Next I'm going to read a list of statements about stop-smoking medications. Please tell me if you agree or disagree with each statement.

[IF NEEDED: Stop smoking medications mean Nicotine Replacement Therapy and prescription medications]

		AGREE	DISAGREE	REF	DK
a.	If you decided you wanted to quit, you would be able to quit without stop-smoking medications.	1	2	-7	-8
b.	Stop-smoking medications are too expensive.	1	2	-7	-8
c.	You don't know enough about how to use stop-smoking medications properly.	1	2	-7	-8
d.	Stop-smoking medications are too hard to get.	1	2	-7	-8
e.	Stop-smoking medications might harm your health.	1	2	-7	-8
f.	Stop-smoking medications don't work	1	2	-7	-8

SECTION G: Health Care Provider Smoking Intervention

BOX G1

PROGRAMMER CHECK NOTE: ASK G1 OF ALL RESPONDENTS.

G1. In the past 12 months, did you visit any doctor or other health care provider about your own health?

YES	1	
NO	2	SKIP TO BOX H36
REF	-7	SKIP TO BOX H36
DK	-8	SKIP TO BOX H36

BOX G2

DESCIPTIVE NOTE: ASK G2 TO RESPONDENTS WHO HAVE SEEN A HEALTH CARE PROVIDER IN THE PAST 12 MONTHS (G1 = 1)

G2. In the past 12 months, did a doctor or other health care provider ask if you smoke?

YES	1
NO	2
REF	-7
DK	-8

BOX G3

DESCRIPTIVE NOTE: ASK G3 TO CURRENT SMOKERS (SSTAT = C1, C2, C3), FORMER SMOKERS WHO HAVE SMOKED IN PAST 30 DAYS (SSTAT = F2), AND FORMER SMOKERS WHO HAVE NOT SMOKED REGULARLY IN PAST 30 DAYS (SSTAT = F1) BUT HAVE SMOKED REGULARLY WITHIN THE PAST YEAR (D12YR ≤ 1 YEAR OR (D13e = 1 OR D13f =1 or d13g = 1 OR D13h = 1)).

PROGRAMMER NOTE: FOR THE FOLLOWING INSTRUCTION, USE D12YR CALCULATED IN BOX E1.

IF (SSTAT = X1 OR X2 OR NS) OR (SSTAT = F1 AND (1 < D12YR ≤ 99.9 OR D13a = 1 OR D13b =1 OR D13c = 1 OR D13d = 1)), SKIP TO BOX H36

NOTE: FOR THE FORMER SMOKERS WHO HAVE NOT SMOKED IN PAST 30 DAYS (SSTAT = F1), THIS SKIP WILL EXLCUDE THOSE WHO REPORTED IN D12 THAT THEY NEVER SMOKED REGULARLY AND THOSE WHO DID NOT SMOKE REGULARLY WITHIN THE PAST YEAR, BASED ON YEARS REPORTED IN D12 OR RELEVANT QUESTIONS IN D13.

G3. In the past 12 months, did any doctor or other health care provider advise you to quit smoking?

YES	1
NO	2
REF	-7
DK	-8

G4a. In the past 12 months, was medication recommended or discussed by a doctor or other health care provider to help you quit? Examples of medication are: nicotine gum, patch, lozenge, or prescription medication.

YES	1
NO	2
REF	-7
DK	-8

G7. [If YES to G4a]

In the past 12 months, how often was medication recommended or discussed by a doctor or other health care provider to help you quit? Would you say never, rarely, sometimes or always?

[IF NEEDED: examples of medication are nicotine gum, patch, lozenge, or prescription medication.]

RARELY	2
SOMETIMES	3
ALWAYS	4

G4b. In the past 12 months, did your doctor or other health care provider discuss or offer services other than medication to help you quit? Examples are: telephone helplines, individual or group counseling, or cessation programs.

YES	1	
NO	2	SKIP TO BOX H36
REF	-7	SKIP TO BOX H36
DK	-8	SKIP TO BOX H36

G9. [If YES to G4b]
In the past 12 months, how often did your doctor or other health care provider discuss or offer services other than medication to help you quit? [Repeat examples if needed: telephone helplines, individual or group counseling, or cessation programs.]

Would you say never, rarely, sometimes or always?

RARELY	2
SOMETIMES	3
ALWAYS	4

Public Health Campaigns and Policies

BOX H36

DESCRIPTIVE NOTE: ASK H36 TO:
CURRENT SMOKERS (SSTAT = C1, C2, C3),
FORMER SMOKERS WHO HAVE SMOKED IN THE PAST 30 DAYS (SSTAT = F2),
FORMER SMOKERS WHO HAVE NOT SMOKED IN THE PAST 30 DAYS (SSTAT = F1) BUT HAVE SMOKED REGULARLY WITHIN THE PAST 2 YEARS (D12YR ≤ 2 YEARS OR D13d = 1 OR D13e = 1 OR D13f = 1 OR D13g = 1 OR D13h = 1), AND
CURRENT EXPERIMENTERS WHO HAVE SMOKED IN THE PAST 30 DAYS (SSTAT = X1).

PROGRAMMER NOTE: FOR THE FOLLOWING INSTRUCTION, USE D12YR CALCULATED IN BOX E1.

IF (SSTAT = NS or X2) OR ((SSTAT = F1) AND (2 < D12YR ≤ 99.9 OR D13a = 1 OR D13b = 1 OR D13c = 1)), SKIP TO BOX H8
NOTE: FOR THE FORMER SMOKERS WHO HAVE NOT SMOKED IN PAST 30 DAYS (SSTAT = F1), THIS SKIP WILL EXLCUDE THOSE WHO REPORTED IN D12 THAT THEY NEVER SMOKED REGULARLY AND THOSE WHO DID NOT SMOKE REGULARLY WITHIN THE PAST 2 YEARS, BASED ON YEARS REPORTED IN D12 OR RELEVANT QUESTIONS IN D13.

H36. Taxes on the purchase of tobacco products have increased in the past 12 months in Minnesota. What effects if any, did this price increase have on your smoking? Did it ….?

		YES	NO	REF	DK
a.	Help you think about quitting?	1	2	-7	-8
b.	Help you to cut down on cigarettes?	1	2	-7	-8
c.	Help you make a quit attempt?	1	2	-7	-8
d.	Help you maintain a quit?	1	2	-7	-8

EXPOSURE TO SHS

BOX H8

IF LANDLINE CASE AND A ONE-ADULT HH, SKIP TO BOX H9.

DISPLAY NOTE: IF SSTAT = C1, C2, C3, F2, X1 OR X2 USE FIRST DISPLAY IN H8, ELSE USE SECOND DISPLAY.

H8 HARD RANGE IS 0 – 15.

H8. {Not including yourself, how/How} many of the adults who live in your household smoke cigarettes, cigars or pipes?

|__|__| ENTER NUMBER OF ADULTS WHO SMOKE

REF -7
DK/NOT SURE -8

BOX H9

IN H9 HARD RANGE 0-7, -7 AND -8.

H9. During the past 7 days, how many days did anyone smoke cigarettes, cigars, or pipes anywhere inside your home?

[ANYONE INCLUDES THE RESPONDENT.]

_____ ENTER NUMBER OF DAYS

REF -7
DK -8

H10. Which statement best describes the rules about smoking inside your home? Do not include decks, garages, or porches.

Smoking is not allowed anywhere inside your home, 1
Smoking is allowed in some places or at some times or, 2
Smoking is allowed anywhere inside the home? 3
REF -7
DK/NOT SURE -8

H22. In the past seven days, have you been in a car with someone who was smoking?

[SOMEONE MEANS A PERSON OTHER THAN THE RESPONDENT.]

YES	1
NO	2
REF	-7
DK/NOT SURE	-8

H34. Not counting motorcycles, in the vehicles that you or family members who live with you own or lease, is smoking…

Always allowed in vehicles,	1
Sometimes allowed in at least one vehicle, or	2
Never allowed in any vehicle?	3
NO ONE IN FAMILY OWNS A VEHICLE	4
DK	-7
Refused	-8

BOX H23
SKIP TO H31 IF CURRENT SMOKER (SSTAT=C1, C2, C3, F2, OR X1)

H23. In Minnesota, in the past 7 days, has anyone smoked near you at any place besides your home or car?

YES	1	
NO	2	SKIP TO H31
REF	-7	SKIP TO H31
DK	-8	SKIP TO H31

H24. The last time this happened, in Minnesota, where were you? Were you at...

A restaurant or bar outdoor patio,	12
An outdoor shopping mall or strip mall,	6
A community sports event,	7
A gambling venue,	8
A park,	4
A bus stop,	13
A parking lot,	14
A building entrance,	5
Another person's home,	9
Another person's car,	10
Somewhere else outdoors, or	15
Some other place?	11
REF	-7
DK/NOT SURE	-8

H35. In the past week, about how many minutes or hours were you exposed to other people's tobacco smoke in all environments?

|__|__| ENTER NUMBER [RANGE IS 0-168]
HOURS

|__|__| ENTER NUMBER [RANGE IS 0-59]
MINUTES

REF	-7
DK/NOT SURE	-8

SMOKE FREE POLICIES IN PUBLIC PLACES

H31. The next question is about smoking in cars. Do you think smoking should be allowed in cars when children are in them?

YES	1
NO	2
REF	-7
DK	-8

H32. I am going to read a list of outdoor areas. Please tell me whether or not you think smoking should be allowed in each area.

[IF NEEDED CLARIFICATION: WE ARE ASKING IF SMOKING SHOULD BE ALLOWED OR NOT ALLOWED ANYWHERE IN THESE OUTDOOR AREAS, WITHOUT EXCEPTION]

		SMOKING ALLOWED	SMOKING NOT ALLOWED	REF	DK
a.	Outdoor patios of restaurants, cafes and bars	1	2	-7	-8
b.	Outdoor areas near building entrances and exits?	1	2	-7	-8
c.	County fairs or community-sponsored gatherings?	1	2	-7	-8
d.	Public sidewalks?	1	2	-7	-8
e.	Public parks, playgrounds, and beaches?	1	2	-7	-8

H33. J1The next question is about smoking in casinos in Minnesota.

Do you think smoking should be allowed in Minnesota Casinos throughout the building or not all?

ALLOWED THROUGHOUT THE BUILDING	1
NOT ALLOWED AT ALL	3
REF	-7
DK	-8

SECTION I: RISK PERCEPTION AND SOCIAL INFLUENCES

Risk Perception

I1. Next I'd like to ask your opinion about some tobacco and health related issues.

Do you believe there is any harm in having an occasional cigarette?

YES	1
NO	2
REF	-7
DK/NOT SURE	-8

BOX I2

DISPLAY INTERVIEWER NOTES FOR ITEMS a and f:

a. A HOOKAH IS ALSO KNOWN AS A SHISHA (ARABIC) OR NARGILA (TURKISH)). A HOOKAH OR WATER PIPE IS A DEVICE FOR SMOKING THAT USES WATER TO COOL AND MOISTEN THE SMOKE. IT IS OFTEN MADE OF GLASS. IT SOMETIMES HAS SEVERAL MOUTHPIECES, SO THAT PEOPLE CAN SHARE IT.

f. AN ELECTRONIC CIGARETTE IS A NEW PRODUCT THAT LOOKS LIKE A REGULAR CIGARETTE, BUT IS NOT LIGHTED LIKE A CIGARETTE. IT RUNS ON A BATTERY AND HAS A SMOKE-LIKE VAPOR THAT IS PRODUCED ELECTRONICALLY. THE VAPOR CONTAINS NICOTINE, BUT THE E-CIGARETTE DOES NOT CONTAIN OR BURN ANY TOBACCO.

I2. In your opinion, are the following products less harmful, more harmful, or just as harmful as smoking cigarettes?

		LESS	MORE	JUST AS	REF	DK
a.	Smoking tobacco in a hookah water pipe?	1	2	3	-7	-8
h.	Little filtered cigars that look like cigarettes	1	2	3	-7	-8
d.	Natural cigarettes like Native Spirit cigarettes	1	2	3	-7	-8
e.	Roll-your-own cigarettes?	1	2	3	-7	-8
f.	Electronic or e-cigarettes	1	2	3	-7	-8
b.	Other smokeless tobacco, such as snuff and chewing tobacco	1	2	3	-7	-8

I3. Now I am going to ask about smoke from other people's cigarettes.

Do you think that breathing smoke from other people's cigarettes is...

Very harmful to one's health,	1
Somewhat harmful to one's health,	2
Not very harmful to one's health or,	3
Not harmful at all to one's health?	4
REF	-7
NO OPINION/DK/NOT SURE	-8

I20. In your opinion, from 1 to 7, with 1 indicating "not at all harmful" and 7 indicating "extremely harmful," how harmful is breathing in secondhand smoke outside for a brief period of time, like at a building entrance as you walk in?

1	NOT AT ALL HARMFUL
2	
3	
4	
5	
6	
7	EXTREMELY HARMFUL

Section J: Closing Demographic Items

J1d. Let me remind you that all your answers are confidential. The last few questions will help us make sure that we have a representative sample of respondents.

Are there any children under age 18 living in this household?

YES	1
NO	2
REF	-7
DK/NOT SURE	-8

J2. Are you currently. . .

Married,	1
A member of an unmarried couple,	2
Divorced,	3
Widowed,	4
Separated, or	5
Never married?	6
REF	-7

J3. Are you Hispanic or Latino?

YES	1
NO	2
REF	-7
DK/NOT SURE	-8

J4. Which one or more of the following would you say is your race? Are you…

[READ ALL RESPONSE OPTIONS-SELECT ALL THAT APPLY]

		YES	NO	REF	DK/NOT SURE
a.	White	1	2	-7	-8
b.	Black or African American	1	2	-7	-8
c.	Asian	1	2	-7	-8
d.	Native Hawaiian or Other Pacific Islander	1	2	-7	-8
e.	American Indian or Alaska Native, or	1	2	-7	-8
f.	Some other race?	1	2	-7	-8
J4fOS	If J4f = 1: What is that other race?	[SPECIFY] _____			

BOX J5

DESCRIPTIVE NOTE: ASK J5 TO RESPONDENTS WHO REPORT THAT THEIR RACIAL BACKGROUND IS MIXED (MORE THAN ONE RACE), THAT IS, MORE THAN ONE RESPONSE IN J4a-f = 1. J5 ASKS WHICH RACE BEST REPRESENTS HIS/HER RACE.

IF ONLY ONE RESPONSE IN J4a-f = 1, SKIP TO J15.

DISPLAY NOTE: IN J5 DISPLAY ONLY THOSE RACE CATEGORY LABELS CORRESPONDING TO THOSE WHERE J4a THROUGH J4f = 1; ALWAYS DISPLAY OPTION 7. FOR OPTION 6, DISPLAY J4fOS VERBATIM TEXT.

J5. Which one of these would you say *best* represents your race? Would you say…

{White},	1
{Black or African American},	2
{Asian},	3
{Native Hawaiian or Other Pacific Islander},	4
{American Indian or Alaska Native}, or	5
J4OS {VERBATIM TEXT}	6
RACIAL BACKGROUND EQUALLY DIVIDED	7
REF	-7
DK	-8

J15. Do you live in an apartment building, condo, townhome, or other building with shared walls?

YES	1	
NO	2	SKIP TO J10
REF	-7	SKIP TO J10
DK/NOT SURE	-8	SKIP TO J10

BOX J16
SKIP TO J10 IF SSTAT=C1, C2, C3, F2, X1, ELSE CONTINUE TO J16

J16. During the past 7 days, have you smelled smoke from cigarettes, cigars or pipes anywhere inside the building, including your own apartment?

YES	1
NO	2
REF	-7
DK	-8

J10. In studies like this, households are sometimes grouped according to income. Please tell me which group best describes an estimate of the total combined income of all persons in this household over the past year. Please include money income from all sources, such as salaries, interest, retirement, or any other source for all household members. Would you say...

[IF NECESSARY PROBE: Include income from all sources such as: earnings; social security and public assistance payments; dividends, interest and rent; unemployment and worker's compensation; government and private employee pensions.]

Less than $10,000,	1
$10,001 - $20,000,	2
$20,001 - $25,000,	3
$25,001 - $35,000,	4
$35,001 - $50,000,	5
$50,001 - $75,000, or	6
$75,001-$$100,000, or	7
More than $100,000?	8
REF	-7
DK	-8

J11. What is the highest level of school you completed?

COMPLETED 8TH GRADE OR LESS	1
SOME HIGH SCHOOL BUT NO DIPLOMA	2
COMPLETED HIGH SCHOOL (DIPLOMA)	3
EARNED GED	4
SOME COLLEGE BUT NO DEGREE (INCLUDES TECHNICAL OR TRADE SCHOOL AFTER RECEIVING A HIGH SCHOOL DIPLOMA / GED.)	5
COMPLETE A TWO YEAR COLLEGE DEGREE (AA OR AS DEGREE)	6
COMPLETED A FOUR YEAR COLLEGE DEGREE (BA, BS, RN DEGREE)	7
SOME GRADUATE OR PROFESSIONAL SCHOOL AFTER COLLEGE BUT NO DEGREE	8
COMPLETED GRADUATE OR PROFESSIONAL SCHOOL AFTER COLLEGE (MA, MS, PHD, MD, DDS, OR HIGHER)	9
REF	-7
DK	-8

BOX J11a

DESCRIPTIVE NOTE: ASK J11a ONLY TO 18- 24 YEAR OLDS.

IF A5 > 24 OR A6 = 2, 3, 4, 5, 6, OR 7, SKIP TO BOX K1.

J11a. Are you currently seeking a degree, certification, or license in a 4 year college, a 2 year college, a technical school, high school, or a GED program?

[REFERS TO ANY CURRENT SCHOOLING, INCLUDING GRADUATE SCHOOL.]

YES	1	
NO	2	SKIP TO R1
REF	-7	SKIP TO R1
DK	-8	SKIP TO R1

J11b. What type of degree, certification, or license is that?

GRADUATE OR PROFESSIONAL SCHOOL	1
4 YEAR COLLEGE	2
2 YEAR COLLEGE (COMMUNITY COLLEGE)	3
TECHNICAL SCHOOL OR VO-TECH (VOCATIONAL-TECHNICAL SCHOOL)	4
GED PROGRAM	5
HIGH SCHOOL	6
OTHER	7
REF	-7
DK	-8

J11bOS. IF J11b = 7 [SPECIFY OTHER] _____

BOX K1

QUESTIONS SC30 TO K3 ARE TO BE ASKED ONLY OF LAND LINE RESPONDENTS. ELSE, IF CELL PHONE RESPONDENT, GO TO GOODBYE.

IF RESPONDENT BREAKS OFF IN SECTION K, FINALIZE AS COMPLETED INTERVIEW; THERE WILL BE NO CALL BACK.

SC30. Because we are conducting this study by phone, I have some questions about the telephone numbers in your household.

Besides the number I called, do you have other telephone numbers in your household, not including cell phones?

YES	1
NO	2
DK/NOT SURE	-7
REFUSED	-8

SC31. Including computer and fax phone numbers, how many of these additional phone numbers are for home use?

[IF NEEDED: Do not include cell phones.]

ONE	1
TWO	2
THREE	3
FOUR	4
FIVE	5
SIX OR MORE	6
DK/NOT SURE	-8
REFUSED	-7

K1. Do you have a working cell phone?

Yes	1	GO TO K2
No	2	GO TO R1
Share cell phone	3	GO TO K2
REFUSED	-7	GO TO R1
DON'T KNOW	-8	GO TO R1

K2. Is that cell phone for personal use or business use?

Personal use only	1	GO TO K3
Business use only	2	GO TO R1
Both personal and business use	3	GO TO K3
REFUSED	-7	GO TO R1
DON'T KNOW	-8	GO TO R1

K3. Of all the telephone calls that you receive, are...

All or almost all calls received on cell phone	1
Some received on cell phones and some on regular phones, or	2
Very few or none received on cell phones?	3
REFUSED	-7
DON"T KNOW	-8

R1. The Minnesota Department of Health and ClearWay Minnesota might be interested in doing a follow-up interview with you again in the future. Would you be willing to be contacted again?

YES
NO/DK/REFUSED → SKIP TO GOODBYE

R2. Any contact information you provide will remain confidential and will only be accessible to researchers at the Minnesota Department of Health and ClearWay Minnesota and will only be used to contact you for possible future research efforts. To make sure we are able to reach you again, may I please have your name?

FIRST NAME_____
LAST NAME _____

R3. Is this your home landline phone, work phone or cell phone number? [DISPLAY SYSTEM PHONE NUMBER]

HOME
WORK
CELL
DK
REFUSED

R4. Is there also another phone number where we could reach you? [IF YES]: What is that number?

ENTER NUMBER_____
NO → SKIP TO R6
DK/REFUSED → SKIP TO R6

R5. Is this second number a home phone, work phone, or cell phone?

HOME
WORK
CELL
OTHER
DK
REFUSED

R6. The Department of Health and ClearWay Minnesota might want to mail you some information. May I please get your mailing address?

[ALLOW ENTRY FIELDS FOR 2 ADDRESS LINES, CITY, STATE, AND ZIP]

R7. What is your email address?

GOODBYE That's my last question. Thank you very much for your time and cooperation.
PRESS ANY KEY TO COMPLETE INTERVIEW

WRGST I'm sorry, but we are only interviewing residences that are in the state of Minnesota. Thank you very much for your time.
PRESS ANY KEY TO TERMINATE

Appendix B

MATS 2014 Landline Screener Questionnaire

SCREENER FOR LANDLINE SAMPLE

L1:

Hello, my name is ____. I am calling on behalf of the Minnesota Department of Health. [We are conducting general health interviews with Minnesota residents. Your phone number has been chosen randomly, and I'd like to ask some questions about health behaviors and tobacco use.] Are you a member of this household and at least 18 years old? NOTE: CALLBACK NAME IS: <FNAME><BDAY2><Q14><Q13>

YES	1	
NO	2	=> S3A
GO TO RESULT	3	=> CODE CALL RESULT

LQ1R:

Do you live in Minnesota?

YES	1	
NO	2	=> CODE AS INELIGIBLE
REFUSED	-7	=> CODE AS INELIGIBLE
DON'T KNOW	-8	=> CODE AS INELIGIBLE

S1B:

Is this phone number used for. . .

Home use	1	=> S5
Home and business use, or	2	=> S5
Business use only?	3	=> CODE AS INELIGIBLE
GO TO RESULT	4	=> CODE CALL RESULT

S3A:

May I please speak with a household member who is at least 18 years old? [HOUSEHOLD (HH) MEMBERS INCLUDE PEOPLE WHO THINK OF THIS HH AS THEIR PRIMARY PLACE OF RESIDENCE. IT INCLUDES PERSONS WHO USUALLY STAY IN THE HH BUT ARE TEMPORARILY AWAY ON BUSINESS OR IN A HOSPITAL.] [COLLEGE STUDENTS AWAY AT SCHOOL ARE CONSIDERED HH MEMBERS IF THEY ARE IN MINNESOTA BUT NOT IF THEY ARE OUT OF STATE]. [PART-TIME RESIDENTS OF MINNESOTA ARE ELIGIBLE IF THEY ARE CURRENTLY IN MINNESOTA. IF THEY WILL BE BACK IN MINNESOTA BEFORE JUNE 2014, SET A CALLBACK FOR A DATE WHEN THEY MIGHT BE BACK].

YES	1	
NO - SET AS CALLBACK OR REFUSAL	2	=> CODE CALL RESULT
THERE ARE NONE	3	=> CODE AS INELIGIBLE

S4:

Hello, I'm ____ with Westat. I'm calling on behalf of the Minnesota Department of Health.
Are you a member of this household and at least 18 years old?

YES	1	=> LQ1R
NO	2	=> S3A
GO TO RESULT	3	=> CODE CALL RESULT

S4RES:

Is this phone number used for. . .

Home use	1	
Home and business use, or	2	
Business use only?	3	=> CODE AS INELIGIBLE
GO TO RESULT	4	=> CODE CALL RESULT

S5:

The study we are conducting is about attitudes and behaviors related to health and tobacco use and will be used to help all Minnesotans live healthier lives. Your participation is voluntary and important to the success of this study.

CONTINUE	CT	
GO TO RESULTS	GT	=> CODE CALL RESULT

SC5A:

Including yourself, how many adults age 18 and older, currently live in your household? Please include students temporarily living away at a school in Minnesota. [IF NEEDED: Include adults who think of this household as their primary place of residence. Include adults who usually stay in the household but are temporarily away on business, vacation, or in a hospital.] [HOUSEHOLD (HH) MEMBERS INCLUDE PEOPLE WHO THINK OF THIS HH AS THEIR PRIMARY PLACE OF RESIDENCE. IT INCLUDES PERSONS WHO USUALLY STAY IN THE HH BUT ARE TEMPORARILY AWAY ON BUSINESS OR IN A HOSPITAL.] [COLLEGE STUDENTS AWAY AT SCHOOL ARE CONSIDERED HH MEMBERS IF THEY ARE IN MINNESOTA BUT NOT IF THEY ARE OUT OF STATE].

ONE ADULT	1
TWO ADULTS	2
THREE OR MORE ADULTS	3-10
REFUSED	-7
DON'T KNOW	-8

RIZZO SELECTION BOX:

CONTINUE WITH RIZZO METHOD ACCORDING TO THE FOLLOWING RULES:

IF SC5A = 1 (ONE ADULT) AGE 18 OR OLDER IN THE HOUSEHOLD, SELECT THE SCREENER RESPONDENT AS THE SUBJECT. GO TO Q13.

ELSE IF 2 PERSONS AGE 18 OR OLDER, THEN IF RAND1 <= .5, SELECT THE SCREENER RESPONDENT AS THE SUBJECT. GO TO Q13. ELSE IF RAND1 = .5, SELECT THE OTHER PERSON IN THE HOUSEHOLD. GO TO Q14.

ELSE IF MORE THAN 2 PERSONS AGE 18 OR OLDER, THEN IF RAND1 <= 1/N, SELECT THE SCREENER RESPONDENT. GO TO Q13. ELSE GO TO Q15. AND SELECT A PERSON ACCORDING TO THE NEXT BIRTHDAY METHOD.

ELSE, IF NEXT BIRTHDAY UNDETERMINED, GO TO HOUSEHOLD ROSTER (ENUM) AND ROSTER ALL HOUSEHOLD MEMBERS 18 OR OLDER AND SELECT ONE AT RANDOM. RESPONDENT SELECTION BASED ON SC5A

Q13:

You have been selected to participate in this interview. Please tell me just your first name. [IF FIRST NAME REFUSED OR DON'T KNOW, ASK FOR INITIALS, AGE/SEX, RELATION OR OTHER IDENTIFYING INFORMATION.] [PROBE: We need some way to ask for you if we need to call back.]

S5B1:

[ENTER RESPONDENT'S SEX]
MALE 1
FEMALE 2
DON'T KNOW 3

Q14:

Please tell me just the first name of the other adult in this household. [IF FIRST NAME REFUSED OR DON'T KNOW, ASK FOR INITIALS, AGE/SEX, RELATION OR OTHER IDENTIFYING INFORMATION.] [PROBE: We need some way to ask for this person if we need to call back.]

RESP2:

May I please speak to <Q14>?

<Q14> AVAILABLE/COMING TO PHONE	OK	=> SC30
GO TO RESULT	GT	=> CODE CALL RESULT

Q15:

Please tell me just the first name of the adult in this household, other than yourself, who will have the next birthday. [IF NEEDED: We interview only one adult in each household and asking this question helps the computer decide which person that should be.] [IF FIRST NAME REFUSED OR DON'T KNOW, ASK FOR INITIALS, AGE/SEX, RELATION OR OTHER IDENTIFYING INFORMATION.] [IF NEEDED: We need some way to ask for this person if we need to call back.]

YES - ENTER NAME ON NEXT SCREEN 1
DON'T KNOW BIRTHDAYS ..... 2 => ENUM
REFUSED ..... -7 => CODE AS REFUSAL
DONT' KNOW ..... -8 => CODE AS REFUSAL

BDAY2:

What is this person's first name? [IF FIRST NAME REFUSED OR DON'T KNOW, ASK FOR INITIALS, AGE/SEX, RELATION OR OTHER IDENTIFYING INFORMATION.]

BDAYS:

ASK IF NEEDED: Is <BDAY2> male or female?
MALE 1
FEMALE 2
DK/RF 3

ENUM:

So that the computer can choose someone to interview, please tell me the first name and gender of the adults currently living in this household. [IF FIRST NAME REFUSED OR DON'T KNOW, ASK FOR INITIALS, AGE, RELATION OR OTHER IDENTIFYING INFORMATION.] [CLICK NEXT TO CONTINUE].

FNAME:

What is your first name?/ What is the name of adult number __? .....

R_SEX:

ENTER RESPONDENT'S SEX/[IF NEEDED] Is this adult male or female?
MALE 1
FEMALE 2

MORE1:

Are there any other adults in the household we haven't listed?
YES ..... 1 => FNAME
NO 2

RESP3:

<FNAME> has been selected to participate in this interview. May I please speak to <FNAME>? SELECTED RESPONDENT FROM ENUMERATION IS:
NAME: <FNAME> SEX: <R_SEX>
<FNAME> AVAILABLE/COMING TO PHONE ..... OK
GO TO RESULT ..... GT => CODE CALL RESULT

SC30:

Because we are conducting this study by phone, I have some questions about the telephone numbers in your household. Besides the number I called, do you have other telephone numbers in your household, not including cell phones?

YES	1	
NO	2	=> SC34
REFUSED	-7	=> SC34
DON'T KNOW	-8	=> SC34

SC31:

Including computer and fax phone numbers, how many of these additional phone numbers are for home use? [IF NEEDED: Do not include cell phones.]

REFUSED	-7
DON'T KNOW	-8

SC32:

Is this additional phone number used for a computer or fax machine?

YES	1	=> SC35
NO	2	=> A2 (CONSENT)
REFUSED	-7	=> A2 (CONSENT)
DON'T KNOW	-8	=> A2 (CONSENT)

SC34:

Do you have any additional phone numbers for computers or fax machines?

YES	1	
NO	2	=> A2 (CONSENT)
REFUSED	-7	=> A2 (CONSENT)
DON'T KNOW	-8	=> A2 (CONSENT)

SC35:

Some households have telephone numbers that are used for both talking and for computer or fax. How many of these computer or fax numbers are ever answered for talking?

REFUSED	-7
DON'T KNOW	-8

CONSENT STATEMENT TO ALL PARTICIPANTS

A2:

We are conducting general health interviews with Minnesota residents. You have been randomly chosen to be interviewed about attitudes and behaviors related to health and tobacco use. Your responses will represent thousands of other Minnesotans and will be used to help all Minnesotans live healthier lives. Your input is very important for the results to be accurate. The interview is completely voluntary. You don't have to answer any question you don't want to, and you can end the interview at any time. The interview generally takes about 15 minutes, depending on your answers. Any information you give will be held confidential to the fullest extent of the law. [IF NEEDED: THE WESTAT TOLL FREE NUMBER IS 1-855-819-2365]

CONTINUE	CT	=> EXTENDED INTERVIEW
GO TO RESULTS	GT	=> CODE CALL RESULT

Appendix C

MATS 2014 Cell Phone Screener Questionnaire

SCREENER FOR CELL PHONE SAMPLE

Q1

Hello, my name is ____. I am calling on behalf of the Minnesota Department of Health. If you are currently driving a car or doing any activity that requires your full attention, I need to call you back at a later time. We are conducting general health interviews with Minnesota residents. Your phone number has been chosen randomly, and I'd like to ask some questions about health behaviors and tobacco use. Are you at least 18 years old? [END CALL IMMEDIATELY IF R IS DRIVING OR DOING AN ACTIVITY AND SET APPOINTMENT.]
NOTE: CALLBACK NAME IS: <FNAME><BDAY2><Q14><Q13>

YES	1	
NO	2	=> Q2
NOT A CELL PHONE	3	=> Q18
GO TO RESULT	4	=> CODE CALL RESULT

Q1R

Do you live in Minnesota?

YES	1	
NO	2	=> CODE AS INELIGIBLE
REFUSED	-7	=> CODE AS INELIGIBLE
DON'T KNOW	-8	=> CODE AS INELIGIBLE

Q1A

In this part of the study, we are trying to reach people who use cell phone service for their primary telephone. It will take about 2 minutes to see if you qualify for the study.

	1	=> Q4

Q2

Does an adult, 18 years or older ever use this phone?

YES	1	
NO	2	=> CODE AS INELIGIBLE
REFUSED	-7	=> CODE AS REFUSAL
DON'T KNOW	-8	=> CODE AS REFUSAL

Q3

Can I speak to the adult now?

YES	1	=> Q1
NO	2	=> SET CALLBACK
REFUSED	-7	=> SET CALLBACK
DON'T KNOW	-8	=> SET CALLBACK

Q4

Is this cell phone your only phone or do you also have a regular telephone at home? [IF R INDICATES MORE THAN ONE CELL PHONE, BUT NO REGULAR PHONE, CODE "1" FOR CELL IS ONLY PHONE.]

CELL IS ONLY PHONE	1	=> Q9
HAS REGULAR PHONE AT HOME	2	=> Q8
NOT RESPONDENT'S CELL PHONE	3	
NOT A CELL PHONE	4	=> Q18
REFUSED	-7	=> CODE AS REFUSAL
DON'T KNOW	-8	=> CODE AS REFUSAL

Q5

Do you live in the same household with the person who owns this phone number?

YES	1	=> Q7
NO	2	=> SET CALLBACK
REFUSED	-7	=> CODE AS REFUSAL
DON'T KNOW	-8	=> CODE AS REFUSAL

Q7

Does your household have a regular telephone at home?

YES	1	
NO	2	=> Q9
REFUSED	-7	=> Q9
DON'T KNOW	-8	=> Q9

Q8

Of all the telephone calls that you and the people that live with you receive, are ... 1. all or almost all calls received on cell phones 2. some received on cell phones and some on regular phones, or 3. very few or none received on cell phones?

ALL OR ALMOST ALL CALLS RECEIVED ON CELL PHONES	1	
SOME RECEIVED ON CELL PHONES AND SOME ON REGULAR PHONES	2	=> CODE AS INELIGIBLE
VERY FEW OR NONE RECEIVED ON CELL PHONES	3	=> CODE AS INELIGIBLE
REFUSED	-7	=> CODE AS INELIGIBLE
DON'T KNOW	-8	=> CODE AS INELIGIBLE

Q9

Is this cell phone used for ... 1. Personal use, 2. Personal and business use, 3. Business use only?

PERSONAL USE	1	
PERSONAL AND BUSINESS USE	2	
BUSINESS USE ONLY	3	=> CODE AS INELIGIBLE
REFUSED	-7	=> CODE AS INELIGIBLE
DON'T KNOW	-8	=> CODE AS INELIGIBLE

Q10

Including yourself, how many adults age 18 and older, currently live in your household? Please include students temporarily living away at a school in Minnesota. [IF NEEDED:

Include adults who think of this household as their primary place of residence. Include adults who usually stay in the household but are temporarily away on business, vacation, in a hospital.]

ONE ADULT	1	=> A2 (CONSENT)
MORE THAN ONE ADULT	2-10	
REFUSED	-7	=> A2 (CONSENT)
DON'T KNOW	-8	=> A2 (CONSENT)

Q11DS

DISPLAY FOR Q11

Does the other adult	1
Do any of these adults	2

Q11

<Q11DS> receive calls on this cell phone number?

YES	1
NO	2
REFUSED	-7
DON'T KNOW	-8

CONSENT STATEMENT TO ALL PARTICIPANTS

A2

We are conducting general health interviews with Minnesota residents. You have been randomly chosen to be interviewed about attitudes and behaviors related to health and tobacco use. Your responses will represent thousands of other Minnesotans and will be used to help all Minnesotans live healthier lives. Your input is very important for the results to be accurate. The interview is completely voluntary. You don't have to answer any question you don't want to, and you can end the interview at any time. The interview generally takes about 15 minutes, depending on your answers. Any information you give will be held confidential to the fullest extent of the law. [IF NEEDED: THE WESTAT TOLL FREE NUMBER IS 1-888-243-3564]

CONTINUE	CT	=> EXTENDED INTERVIEW
GO TO RESULTS	GT	=> CODE CALL RESULT

Appendix D

MATS 2014 Letters

MINNESOTA MDH DEPARTMENT OF HEALTH

Protecting, maintaining and improving the health of all Minnesotans

[Date]

Dear Fellow Minnesotans:

I am writing to ask for your help with an important telephone survey about the health practices of adults in Minnesota, with an emphasis on tobacco use. We have made several attempts to reach you by phone, but have been unsuccessful.

The survey is being conducted by the Minnesota Department of Health. Your household has been randomly selected for the survey and will represent thousands of Minnesotans. We would like to interview one adult (18 or older) from your household. The survey is relatively brief and held confidential to the fullest extent of the law. Most of the people contacted so far have agreed to complete the survey.

Let me assure you that your responses are very important. The survey will be more accurate and balanced if your experiences and beliefs are included along with those who have already taken the survey. We will keep trying, but you could help us greatly by letting us know when would be the best time to call. Please call Westat, the independent research company that is conducting the interviews, directly at their toll-free number at 1-855-819-2365.

Most of all, we want to obtain the best information possible from people across the state. The survey will provide useful information to health care professionals, medical researchers, and others interested in helping Minnesotans live healthier lives.

If you would like more information about the survey, please contact Westat at the number above. You may also go to the survey website at: http://www.health.state.mn.us/2014HealthStudy. If you would like to verify the study with someone at the Minnesota Department of Health, please call Pete Rode, Research Scientist, at 651-201-5942.

Sincerely,

Diane Rydrych

Diane Rydrych
Assistant Director
Division of Health Policy
Minnesota Department of Health
P.O. Box 64882
Saint Paul, MN 55164-0882

PS: Thank you for considering this request. We hope you choose to take part in this confidential survey about the health of Minnesotans.

General Information: 651-201-5000 • Toll-free: 888-345-0823 • TTY: 651-201-5797 • www.health.state.mn.us
An equal opportunity employer

MINNESOTA MDH DEPARTMENT OF HEALTH

Protecting, maintaining and improving the health of all Minnesotans

Dear Fellow Minnesotans:

You may recall that several weeks ago we asked your household to help us with an important telephone survey about the health practices of adults in Minnesota, with an emphasis on tobacco use.

The survey is being conducted by the Minnesota Department of Health. Your household has been randomly selected for the survey and will represent thousands of Minnesotans. We would like to interview one adult (18 or older) from your household. The survey is relatively brief and held confidential to the fullest extent of the law. Most of the people contacted so far have agreed to complete the survey.

So far, your household has not agreed to participate. Because you represent thousands of people across the state of Minnesota your responses are very important. The survey will be more accurate and balanced if your experiences and beliefs are included along with those who have already taken the survey. We are writing in hopes that we may be able to interview someone from your household by phone. A professional interviewer from Westat, an independent research company, will call you in the next week or two to explain the survey and, hopefully, to begin the interview process.

Most of all, we want to obtain the best information possible from people across the state. The survey will provide useful information to health care professionals, medical researchers, and others interested in helping Minnesotans live healthier lives.

If you would like more information about the survey, please contact Westat at 1-855-819-2365. You may also go the survey website at http://www.health.state.mn.us/2014healthstudy. If you would like to verify the study with someone at the Minnesota Department of Health, please call Pete Rode, Research Scientist, at 651-201-5942.

Sincerely,

Diane Rydrych

Diane Rydrych
Assistant Director
Division of Health Policy
Minnesota Department of Health
P.O. Box 64882
Saint Paul, MN 55164-0882

PS: Thank you for considering this request. We hope you choose to take part in this confidential survey about the health of Minnesotans.

General Information: 651-201-5000 • Toll-free: 888-345-0823 • TTY: 651-201-5797 • www.health.state.mn.us

Appendix E

MATS 2014 Web Page Content

MAIN PAGE

The 2014 Minnesota Health Study

The Minnesota Department of Health and ClearWay Minnesota[SM] are conducting a comprehensive survey about the health practices of adults in Minnesota, with an emphasis on tobacco use. This telephone survey is being conducted by Westat, an independent research organization. The results of the survey will provide useful information to health care professionals, medical researchers and others interested in helping Minnesotans live healthier lives.

A Study of the Health Practices of Minnesota Adults in 2014

This is a comprehensive survey about the health practices of adults in Minnesota, with an emphasis on tobacco use. Between February and May 2014, we will invite over 9,000 Minnesota residents to participate in this telephone survey. Each person who is interviewed will represent not only themselves but also other adults like them in Minnesota.

It is important that we talk with as many people as we can from those invited to participate so that we can accurately understand important health and tobacco-related issues. We hope that if you are selected for an interview you will choose to participate. The results of the survey will provide useful information to health care professionals, medical researchers and others interested in helping Minnesotans live healthier lives.

The survey is being conducted by Westat, an independent research organization, on behalf of the Minnesota Department of Health and ClearWay Minnesota[SM]. Any information you provide during the interview is held confidential to the fullest extent of the law. Your name will never be used in connection with any study results. The information you provide is released only in statistical, summary form. Your responses are added to the responses of others and published as combined information only. Personal identifying information will not be disclosed or released to anyone outside the research team for any purpose and will be protected to the fullest extent of the law.

Click on the links below to find out more about this important study.

- **How participants are selected**
- **How the survey works**
- **Frequently asked questions**
- **Sponsoring agencies**

FIRST LINKED PAGE

How Participants Are Selected

Adult Minnesota residents are randomly selected to participate in the survey from all households in Minnesota. This selection is completely random. The phone numbers are randomly generated from all possible numbers in the state of Minnesota, including both land line and cell phone numbers. We do not know any information about your household before we call. One adult in the household will be asked to be interviewed. These interviews will represent Minnesotans from all across the state.

Your participation in this survey will help achieve our goal of improving the health of all Minnesotans.

SECOND LINKED PAGE

How the Survey Works

Once our professional interviewer has reached you by phone, we will introduce the survey, invite you to participate, and then interview the randomly selected person from your household.

This is not a test and we are not selling anything. We want to know about your health practices and opinions. The survey asks about your tobacco use (if any) and exposure to secondhand smoke. We also ask a few general background questions, such as your age and educational background. You will answer the questions over the phone, so you won't need to write anything down or mail anything. For most people, the survey takes about 15-20 minutes. It may be a few minutes longer depending on the answers to certain questions.

After we have conducted all the interviews, we will combine your answers with everyone else's and analyze them all together. You will not be identified individually in any reports or articles about this survey. Your responses will be held confidential to the fullest extent of the law.

THIRD LINKED PAGE

Frequently Asked Questions

Q: What is the purpose of this survey?
A: The survey results will be used by health-related organizations in Minnesota to develop effective public health strategies and policies. The survey will supply information to health care providers and others interested in helping Minnesotans live healthier lives.

Q: How long will the survey take?
A: For most people, the survey takes about 15-20 minutes. It may be a few minutes longer depending on the answers to certain questions.

Q: Who is the sponsor of the survey?
A: The Minnesota Department of Health and ClearWay Minnesota[SM] are the survey sponsors.

Q: What kinds of questions are asked?
A: This survey asks questions about health behaviors, tobacco use, and exposure to secondhand smoke. We also ask a few general background questions, such as the last grade you completed in school.

Q: Who will see my answers?
A: Survey data will not be shared with anyone outside of the study. The answers you give to this survey will be held confidential to the fullest extent of the law. Your answers will be grouped with those of other people who participate in the survey before they are analyzed, so no report of the results will identify you individually. When Westat sends the data back to the survey sponsors, names and identifying information will not be included.

Q: Will I be able to get the results?
A: Reports about the current survey will be available on the web in the beginning of 2015. Please check back for more information at that time.

Q: How did you get my phone number?
A: A computer randomly chooses phone numbers from all the possible telephone numbers in Minnesota, both landline and cell phone numbers. This is a scientific process to choose a random sample of Minnesota residents. This method will select households with both listed and unlisted numbers.

Your telephone number is confidential and will not be given out to anyone. If your number is unlisted, it will remain unlisted.

Q: Why don't you just call someone else?
A: A computer identified your phone number at random and all the people we call make up a scientific sample of Minnesota residents. Replacing you with anyone else will affect the accuracy of the results. Although the survey is strictly voluntary, we hope that, if you are selected, you will take the opportunity to participate. By choosing to participate, you help to insure that the survey is truly representative of adults in Minnesota.

Q: Who is Westat?
A: Westat is an independent research company hired by the survey sponsors to conduct the interviews with those selected for participation.

FOURTH LINKED PAGE

Sponsoring Agencies

The Minnesota Department of Health and ClearWay Minnesota[SM] are sponsoring the survey. For more information about the survey, please call one of the following individuals or organizations:

- Westat: toll-free at 1-855-819-2365.
- Minnesota Department of Health: Pete Rode at 651-201-5942

MINNESOTA ADULT TOBACCO SURVEY

MATS 2014 Methodology Report

www.mnadulttobaccosurvey.org

ClearWay MINNESOTA

MINNESOTA MDH DEPARTMENT OF HEALTH