MINNESOTA ADULT TOBACCO SURVEY

Tobacco Use in Minnesota: 1999 to 2007

CREATING A HEALTHIER MINNESOTA:
Progress in Reducing Tobacco Use

September 2008

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Executive Summary

Reducing tobacco use among Minnesotans is critical to alleviating the heavy burden of preventable deaths, illnesses and excessive health care costs that result from using tobacco products. ClearWay Minnesota[SM], Blue Cross and Blue Shield of Minnesota (Blue Cross) and the Minnesota Department of Health lead a coordinated effort in Minnesota to discourage people from starting to smoke, to help current smokers quit and to protect all people from exposure to secondhand smoke. The Minnesota Adult Tobacco Survey (MATS) is the primary instrument used to measure progress toward achieving the goals and objectives of Minnesota's tobacco control effort.

Since 1998, funds from the state of Minnesota's and Blue Cross' historic settlement with the tobacco industry have been used to implement comprehensive statewide programs to reduce tobacco use and exposure to secondhand smoke. Concurrent with this significant investment in comprehensive tobacco control programs, important changes took place between 1999 and 2007 in the smoking behavior and attitudes of Minnesotans. Foremost, the prevalence of cigarette smoking declined significantly during a time when the national rate leveled off. The decline in the prevalence means that there are 164,00 fewer smokers in Minnesota in 2007 compared with 1999. The sharp drop in reported smoking prevalence among young adults in just four years (from 2003 to 2007) is one of the most encouraging findings from MATS 2007.

Next, important shifts have occurred in the struggle to quit smoking. More than half of current smokers in Minnesota are trying to quit, with greater percentages of smokers using stop-smoking programs and medications that increase their likelihood of success in quitting. In addition, many smokers report that changes in their environments—including smoke-free policies and the increased price of tobacco products—support their efforts to quit or stay quit.

Finally, dramatic changes have taken place in Minnesotans' attitudes toward and exposure to secondhand smoke. There is widespread awareness of the harm of

secondhand smoke and increased support for smoke-free workplace policies that prevent exposure. In 2007, more Minnesotans were protected by local smoke-free policies than in 2003. With increased protections, fewer Minnesotans were exposed to secondhand smoke than in 2003. Increasingly, Minnesotans have made their homes smoke-free as well. With the passage of the statewide smoke-free law in 2007, which was implemented after data collection for MATS 2007, further declines in secondhand smoke are expected to be found in future MATS.

These positive trends across a multitude of indicators suggest that the comprehensive tobacco control effort in Minnesota is working to reduce the harms that tobacco causes. However, challenges remain. The tobacco industry is well aware of efforts to reduce tobacco use and continues to develop and promote new products. Future MATS should continue to monitor trends in the use of new products as well as smokers' susceptibility to messages that market many of these new products as less harmful than regular cigarettes. Additionally, success in reducing the burden of tobacco addiction is uneven: those with less education and lower incomes are still smoking at markedly higher rates than others. Despite success with young adults, 18-24-year-olds still have the highest smoking rate and the most widespread exposure to secondhand smoke of any adult age group. Furthermore, the smoking rate for non-college youth is not declining. More needs to be done to understand and address smoking in segments of the population with higher rates of tobacco use.

MATS data suggest that a thorough program of proven and innovative activities is creating an environment in Minnesota that supports those who choose to quit tobacco use, protects those who are vulnerable to secondhand smoke exposure and educates those who are targeted by the tobacco industry. Future MATS will continue to monitor tobacco use trends in Minnesota and assess the impact of comprehensive tobacco control efforts.

Some of the most important findings from MATS are summarized on the following pages. All differences presented in this summary are statistically significant at the 0.05 confidence level unless otherwise noted. These surveys were conducted in 1999, 2003 and 2007. MATS collects data by means of telephone interviews with a

representative, random sample of all adult Minnesotans, scientifically weighted to reflect the entire adult population.

Prevalence of Smoking

- Nearly 634,000 adult Minnesotans, or 17.0±1.4 percent, are current smokers. This is a decline of 5.1±2.2 percentage points from 22.1±1.7 percent in 1999.
- About 936,000 adult Minnesotans, or 25.1±1.3 percent, are former smokers.
- About 2.2 million adult Minnesotans, or 57.9±1.6 percent, are considered never smokers (have not smoked 100 cigarettes in their lifetime). Between 1999 and 2007, the percentage of never smokers increased by 5.8±2.6 percentage points.
- Six percent (6.1±0.8 percent) of Minnesotans, including both cigarette smokers and those who do not smoke cigarettes, are current users of one or more non-cigarette tobacco products such as cigars and smokeless tobacco. Most of these non-cigarette users are men.

Quitting Behaviors

- In 2007, 52.4±4.6 percent of current smokers attempted to quit in the past year; over two-thirds of these current smokers made multiple attempts in this period.
- Nearly 15 percent (14.9±4.0 percent) of current smokers with a quit attempt in the past year used some form of behavioral counseling on their last quit attempt, an increase of 11.3±4.4 percentage points from 2003.
- Nearly half (45.5±6.1 percent) of current smokers with a quit attempt in the past year used some kind of stop-smoking medication on their last quit attempt, an increase of 14.6±7.7 percentage points from 2003.
- Among smokers who saw a health care provider, 86.5±3.3 percent were asked by a provider if they smoked, 74.0±4.3 percent were advised not to smoke, and 40.3±5.1 percent received a referral to a stop-smoking program or medication.

- Current smokers who live in homes where smoking is not allowed inside are significantly more likely to make a quit attempt than are smokers who do not have rules against smoking at home.

- In 2005, Minnesota implemented a fee that increased the cost of tobacco products. Overall, 42.7±4.1 percent of current smokers and former smokers who have quit in the past two years said they thought about quitting as a result of the price increase, 29.4±3.7 percent said they cut down on cigarettes and 27.1±4.0 percent said they attempted to quit as a result of the price increase.

Secondhand Smoke Exposure

- Nearly all Minnesotans (93.0±0.8 percent) agree that secondhand smoke is very or somewhat harmful to health.

- Sixty percent (59.9±1.6 percent) of Minnesotans say that prohibiting smoking in workplaces, including restaurants and bars, is very important; an additional 20.4±1.4 percent say that it is somewhat important.

- Between 2003 and 2007, there were several indicators of improvement in reducing secondhand smoke exposure:

  The percentage of Minnesotans exposed to secondhand smoke in the past seven days declined by 10.6±2.3 percentage points, to 56.7±1.6 percent.

  Minnesotans' preference to work in a smoke-free workplace increased by 5.1±2.7 percentage points, to 80.0±1.8 percent.

  The percentage of Minnesotans whose workplace prohibits smoking indoors increased by 7.7±2.8 percentage points, to 76.1±1.9 percent.

  The percentage of Minnesotans living in a home where smoking is prohibited increased by 8.3±2.0 percentage points, to 83.2±1.3 percent.

Young Adults: Smoking, Quitting Smoking and Secondhand Smoke Exposure

- Overall, 28.4±4.8 percent of young adults have smoked in the past 30 days, a decline of 8.4±6.5 percentage points from 2003 (36.8±4.3 percent). (Measuring smoking in the past 30 days is the most useful way to determine current smoking among adolescents and young adults.)

- Among all young adults, 23.0±6.1 percent of the college group (enrolled or graduated) are current smokers, while 41.1±9.6 percent of the non-college group are smokers.

- Between 2003 and 2007, the percentage of current young adult smokers who initiated smoking after age 18 doubled, from 9.2±3.8 percent in 2003 to 19.0±7.7 percent in 2007.

- Among all young adult smokers, 28.9±8.9 percent do not consider themselves smokers.

- Over half (56.1±11.8 percent) of young adult smokers who have had at least one drink in the past 30 days are more likely to smoke while drinking.

- Over half (55.1±9.9 percent) of young adult smokers stopped smoking for one day or longer in the past 12 months because they were trying to quit smoking.

- More than one-fourth (28.7±13.7 percent) of young adult smokers who made a quit attempt in the past 12 months used some form of quit-smoking assistance during their last quit attempt. These include 28.3±13.7 percent who used some form of quit medication and only 1.1±0.9 percent who used any form of behavioral counseling.

- Over 70 percent (73.2±5.1 percent) of young adults were exposed to secondhand smoke in any location over the past seven days, a decline of 8.4±6.3 percentage points from 2003.

- In 2007, 58.3±5.3 percent of young adults were exposed to secondhand smoke in the community in the past seven days. (In the community means anywhere other than work, car or home.) This is a decline of 13.4±7.0 percentage points from 2003.

- In 2007, 12.8±3.5 percent of young adults were exposed to secondhand smoke at home, a decline of 12.1±5.2 percentage points from 2003.
- The percentage of young adults living in a home where smoking is prohibited increased between 2003 and 2007, from 72.2±4.0 percent to 87.5±3.1 percent.

1. The Minnesota Adult Tobacco Survey: 1999 to 2007

1.1 Introduction

Tobacco use harms nearly every organ of the body.[1] Reducing tobacco use among Minnesotans is critical to alleviating the premature deaths, illnesses and excessive health care costs tobacco use causes. As the leading cause of preventable death in the United States, tobacco use kills 438,000 Americans prematurely each year.[2] This count includes approximately 3,000 lung cancer and 35,000 coronary heart disease deaths among nonsmokers due to exposure to secondhand smoke.[3] Among Minnesotans, tobacco use led to over 5,600 premature deaths, $1.98 billion in medical expenses,[4] and $1.5 billion in lost productivity in 2002.[5] In addition, the deaths of 581 infants and adults in Minnesota in 2005 alone can be attributed to the effects of secondhand smoke. In 2003, secondhand smoke was responsible for $215.7 million in excess medical costs in Minnesota.[6]

This report describes tobacco use and quitting, attitudes and beliefs about tobacco and secondhand smoke, social environments that may support quitting and exposure to secondhand smoke among Minnesota's adults, based on the 2007 Minnesota Adult Tobacco Survey (MATS 2007). The Minnesota Adult Tobacco Survey (MATS) is a comprehensive surveillance initiative designed to monitor progress toward meeting the goals 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 tracking the impact of comprehensive tobacco control efforts in Minnesota.

MATS 2007 is the third survey in this ongoing surveillance initiative. MATS 2007 was a telephone survey of more than 12,000 adult Minnesotans, conducted between February and June 2007. (The methodology is discussed in detail in section 1.4.) MATS 1999 data were collected between April and August 1999. MATS 2003 data

were collected between November 2002 and June 2003. Reports from these two previous MATS can be found at www.mnadulttobaccosurvey.org.

This report presents findings from MATS 2007 and identifies important trends in the data from the first MATS in 1999 through this most recent survey. Key findings from this report have been abstracted and presented in five accompanying MATS 2007 briefings. This report and the briefings are available at www.mnadulttobaccosurvey.org.

1.2 MATS Partners

The MATS surveillance initiative and the three surveys—1999, 2003 and 2007—are 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). Together, these three organizations formed the MATS 2007 Advisory Panel that selected Westat as the survey vendor for MATS 2007, made key decisions about survey design and provided oversight for the instrumentation, data collection, analysis and reporting of findings.

ClearWay Minnesota℠ is a nonprofit organization that strives to enhance life for all Minnesotans by reducing tobacco use and exposure to secondhand smoke through research, action and collaboration. ClearWay Minnesota serves Minnesota through its grant-making program, QUITPLAN® Services to help people quit smoking and statewide outreach activities. QUITPLAN Services helped more than 12,700 adult Minnesotans successfully quit tobacco use. ClearWay Minnesota designs and develops innovative statewide multimedia campaigns to inform the public of QUITPLAN Services and raise the awareness of the harm of secondhand smoke exposure. ClearWay Minnesota also works to build capacity and engage priority populations in reducing the harm that tobacco causes their communities. ClearWay Minnesota was created in 1998 when the state received $6.1 billion from its settlement with the tobacco industry and 3 percent, or $202 million, was dedicated by the Ramsey County District Court to establish the independent nonprofit organization.

Blue Cross and Blue Shield of Minnesota is the largest health plan based in Minnesota, covering 2.9 million members in Minnesota and nationally through its health plans or plans administered by its affiliated companies. Prevention Minnesota is Blue Cross' unprecedented, long-term commitment to tackle preventable heart disease and cancers throughout Minnesota by addressing their root causes: tobacco use, exposure to secondhand smoke, physical inactivity and unhealthy eating. Prevention Minnesota is funded by Blue Cross' settlement proceeds from its landmark lawsuit with the tobacco industry, in which Blue Cross was a co-plaintiff with the state of Minnesota. Blue Cross and Blue Shield of Minnesota, a nonprofit corporation, is an independent licensee of the Blue Cross and Blue Shield Association. Blue Cross has provided stop-smoking programs for its members since 2000. Blue Cross also funds efforts to advocate for policy changes that help to reduce tobacco use and secondhand smoke exposure, works with high priority populations to raise awareness of the harm of tobacco use and promotes workplace health improvement.

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.

1.3 Comprehensive Tobacco Control Programs

Scientific evidence confirms what is effective in reducing the harm of smoking and of secondhand smoke exposure. The Centers for Disease Control and Prevention (CDC) and the Office of the Surgeon General recommend implementing a statewide

comprehensive tobacco control program consisting of the following four key strategies:

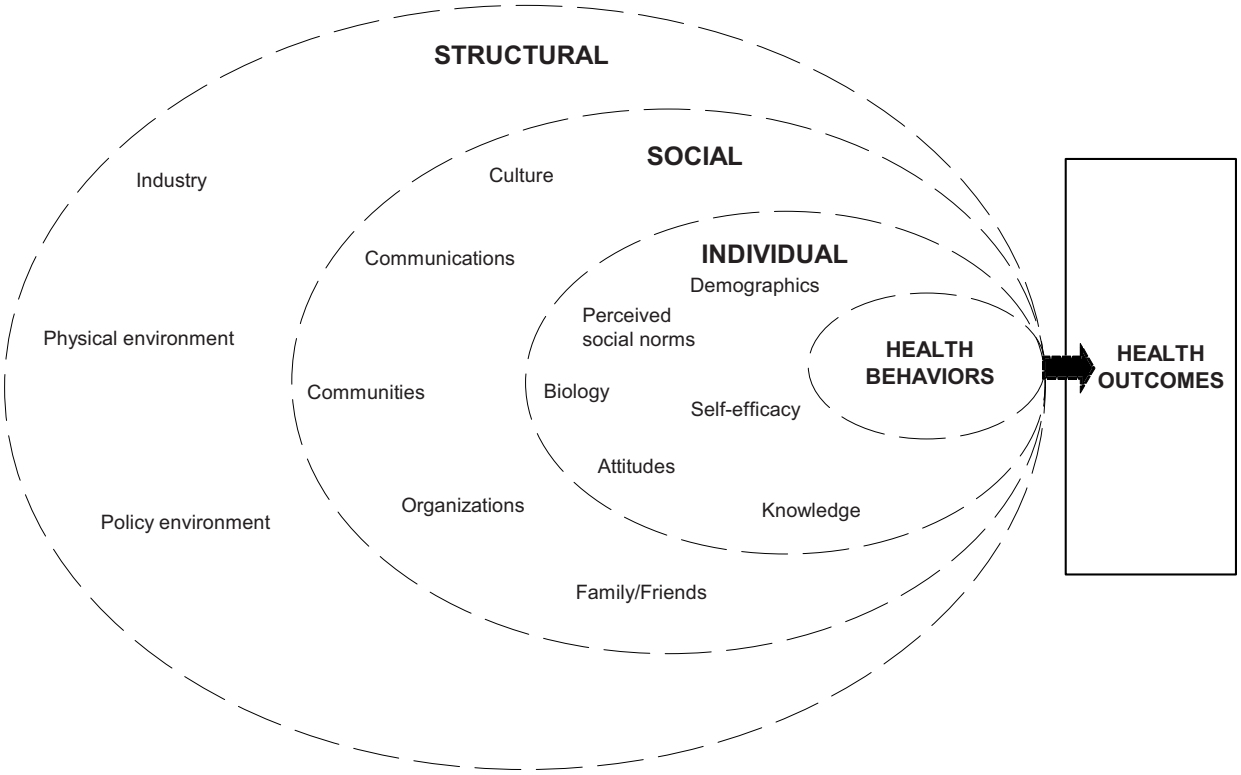
1. helping current smokers to quit,
2. protecting all people from exposure to secondhand smoke,
3. preventing youth from starting to smoke and
4. eliminating tobacco-related health disparities among high-risk groups.[7]

Comprehensive programs target both youth and adult populations at the individual, interpersonal, organizational, community and state levels with a range of educational, clinical and policy strategies. This comprehensive approach builds on the social ecological perspective that recognizes that individuals' behaviors are strongly influenced by the social and structural contexts in which they live, as well as by their own attitudes and beliefs.[8] Therefore, interventions aimed at changing behavior should not focus on the individual alone, but also address the social, economic and environmental influences as well. Figure 1-1 displays key sources of structural and social influences that affect health behavior at the individual level. By intervening in multiple settings using a variety of strategies, this framework for behavior change guides comprehensive efforts to reduce tobacco use and improve the health of all Minnesotans.

1.3.1 Minnesota's Comprehensive Tobacco Control Program

ClearWay Minnesota, Blue Cross and MDH lead coordinated efforts in Minnesota to implement comprehensive statewide programs to reduce tobacco use and exposure to secondhand smoke. The following section highlights a few initiatives in each of the four key strategy areas. Many of these programs, along with others, are discussed in further detail in the individual chapters of this report.

Figure 1-1. Framework for behavior change



Helping Smokers to Quit

Minnesota is a national leader in establishing and maintaining effective quit-smoking services statewide. Through the combined efforts of ClearWay Minnesota and the major health plans, smokers have either insurance coverage for or free access to quit-smoking medications. This accessibility has greatly increased since 1998.

ClearWay Minnesota offers evidence-based quit-smoking programs through QUITPLAN Services. By calling a single phone number, smokers are directed to the service that best meets their individual needs. The QUITPLAN Helpline provides free counseling and nicotine replacement therapy, such as the nicotine patch and gum, to Minnesotans who do not have coverage through their health insurance; insured callers are transferred directly to their health plan's quitline. QUITPLAN Services also include centers that provide face-to-face tobacco counseling in over 20

health care settings across the state and quitplan.com, a free website that provides individual support as well as interactive quit-smoking resources. Through QUITPLAN at Work, ClearWay Minnesota provides smokers with free group counseling sessions at their workplaces. QUITPLAN community-tailored centers serve specific populations such as Latinos, African Americans, Southeast Asians, Somalis and Native Americans through culturally specific, community-tailored strategies. Through 2007, QUITPLAN Services have helped more than 12,700 adult Minnesotans successfully quit tobacco use.

Through Call it Quits, a unique collaboration of Minnesota's major health plans and ClearWay Minnesota, free telephone-based counseling services are available to all Minnesotans. Call it Quits is a collaboration of Minnesota's major health plans – including UCare Minnesota, HealthPartners, Metropolitan Health Plan, Medica, PreferredOne, MMSI and Blue Cross Blue Shield of Minnesota – and ClearWay Minnesota. With support from Blue Cross, the Call it Quits collaborative has also implemented a statewide clinic fax referral program designed to efficiently refer patients from their doctor's office to telephone-based counseling services.

Tobacco related policies also have an impact on quitting. Recognizing that higher tobacco prices not only keep youth from starting to smoke but also encourage adults to quit smoking, Blue Cross led a collaborative effort to raise the cost of tobacco products in the state of Minnesota. As a result, the Minnesota Legislature enacted a 75-cent health impact fee on every pack of cigarettes sold in Minnesota that became effective Aug. 1, 2005. Similarly, local smoke-free ordinances enacted in Minnesota, while intended to protect employees and patrons from the harm of secondhand smoke, also impacted quitting by smokers exposed to those policies.

Protecting All Minnesotans from Exposure to Secondhand Smoke

ClearWay Minnesota, Blue Cross and MDH have provided funding to local groups working to help create and sustain smoke-free environments. This support resulted in smoke-free policies in many Minnesota communities, in addition to building momentum for smoke-free workplaces around the state and the eventual passage of a strong statewide smoke-free workplace law. In addition, ClearWay Minnesota has designed and produced innovative statewide advertising campaigns designed to

stress the health dangers of secondhand smoke in public settings and to spur changes in social norms and community policies.

Preventing Youth from Starting to Smoke

MDH provides grants to local communities to reduce youth tobacco use by promoting a social environment in which youth view tobacco use as undesirable and unacceptable. The department also supports efforts to reduce point-of-sale marketing of tobacco, eliminate tobacco sponsorship of events and reduce the acceptance of tobacco industry donations by community groups.

Eliminating Tobacco-Related Health Disparities among Priority Populations

The three lead tobacco control organizations in Minnesota work to build capacity in diverse priority populations to reduce the harm that tobacco causes those communities. Priority populations are broadly defined as communities who have higher rates of tobacco use, are less likely to use mainstream cessation services, have higher rates of tobacco-related disease and death and are targeted by the tobacco industry. Initiatives aimed at priority populations include community-based participatory research to reduce the harm of tobacco in the Latino and Southeast Asian communities of Minnesota, jointly supported by ClearWay Minnesota and Blue Cross. ClearWay Minnesota has implemented a leadership institute to build tobacco control leadership in Minnesota's priority populations and has provided research grants to community groups to conduct tobacco-related research. Blue Cross implemented a tailored communications campaign to reach young adults (aged 18-24). Currently, MDH provides technical assistance and funding to 10 American Indian tribal communities and two community groups serving urban American Indians to assist them in lowering smoking rates.

1.4 Methodology

The MATS project collects and analyzes data to monitor the effects of tobacco-related policies and programs and to support the planning and design of future interventions. Researchers, public health officials, policy makers, health care

providers and others can use this information to evaluate the progress made by tobacco control interventions in changing health behavior on a statewide basis.

1.4.1 Study Design

MATS 2007 is a telephone survey designed to collect public health and tobacco-related data about the general adult population of Minnesota. The survey design incorporated the following principal components.

Survey Sample

The MATS Advisory Panel and Westat designed and drew scientific samples that are representative of the Minnesota adult population in 2007. The sample design called for a random-digit dialing (RDD) sample of the adult Minnesota population, combined with a sample of Blue Cross members drawn from administrative records. To support an increased focus on African Americans and adults 18 to 24 years old, the sample design included methods to oversample these groups.

The precision of the survey estimates is largely dependent on the size of the sample. When a survey sample is more complex than a simple random sample, as in the case of MATS 2007, larger sample sizes are needed to achieve the same overall precision than would be needed from a simple random sample. To meet the survey's precision goals, the sample design targeted 7,500 adults from the statewide RDD survey and 5,000 adults from a list of Blue Cross members.

Within this overall sample of 12,500 adults, there were subsidiary targets for 400 African Americans and 2,200 young adults from the combination of RDD and Blue Cross respondents. MATS 2007 oversampled young adults in both the RDD and Blue Cross list sample. In the RDD sample, this was accomplished during the telephone calls by identifying households with young adults in them and then interviewing the young adult from nearly all such households. Blue Cross administrative records include the member's age and were used to supplement the RDD sample for the desired number of young adults. MATS 2007 oversampled African Americans by oversampling random telephone numbers from telephone exchanges in areas with high concentrations of this population according to the Census block information.

The Blue Cross sample was a stratified random sample drawn from the Blue Cross and Blue Shield of Minnesota and Blue Plus membership lists as of Jan. 1, 2007. The sample was drawn proportionally from four types of health plans offered by Blue Cross and Blue Plus: Medicare Supplemental plans, Prepaid Medical Assistance Program (PMAP), MinnesotaCare and commercial plans. Within each plan (except Medicare Supplemental plans), young adults were sampled at a higher rate than other members. The Blue Cross sample was designed both to provide results for internal reporting on the Blue Cross population and to supplement the RDD sample. The sampling plan aimed to combine the Blue Cross and RDD samples in a statistically valid manner in order to produce a unified, combined file of 12,500 respondents who are representative of the adult Minnesota population. All of the results contained in this report apply to the general population; no results are reported for the Blue Cross sample separately.

Questionnaire Development

The MATS Advisory Panel and Westat developed a questionnaire that would obtain all the data items needed to support the planned analyses for MATS 2007 and to compare key statistics from MATS 2007 with the two previous MATS. The questionnaire covered general physical and mental health, alcohol use, cigarette smoking and other tobacco use, smoking cessation, experience with health care provider smoking interventions, attitudes toward 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. Most survey questions were derived from MATS 2003, from standard questions developed by the CDC, and from questions tested and used in other tobacco surveillance surveys, such as the ongoing California Adult Tobacco Survey. The same questionnaire was administered to both RDD and Blue Cross sample respondents.

The MATS Advisory Panel and Westat sought to strike a balance between maintaining continuity with previous MATS questionnaires and making two types of changes that would improve the data for current and future analyses. These two types of changes were the addition of new questions to address emergent public health issues, and the careful modification of the wording and structure of a few

questions used in previous MATS questionnaires to improve their clarity for respondents.

Before implementing data collection, a live pilot test of the instrument was conducted with an RDD survey of 100 test respondents, resulting in only minor changes.

Data Collection

Data collection took place in 2007, between February 12 and June 24. The questionnaire was administered using a computer-assisted telephone interviewing (CATI) system. The RDD sample was identified and selected using standard RDD survey procedures, which include conducting a household screener interview to identify residential phone numbers and then selecting one household member for the MATS interview. Operational procedures to support the administration of the questionnaire included telephone contacting rules and procedures that met or exceeded the standard requirements for the CDC Behavioral Risk Factor Surveillance System surveys (BRFSS). At least 15 attempts were made to contact households and individuals identified and selected through the RDD survey or to reach individuals in the Blue Cross sample. Supporting measures included an informational website, advance notification letters and letters sent to those who initially declined to respond to the survey to encourage them to participate. According to BRFSS protocol, telephone interviewers recontacted anyone who initially declined participation in a second attempt to secure their cooperation.

The final sample sizes slightly exceeded the sample plan: 7,532 from the RDD component and 5,048 from the Blue Cross component, for a combined sample of 12,580 completed interviews. The American Association for Public Opinion Research (AAPOR) methodology was used to calculate the weighted RDD response rate of 40.7 percent, which reflects the net response rate across both the household screener questionnaire and the MATS questionnaire (using AAPOR Response Rate Formula 3). There is no standard formula for list samples like the Blue Cross sample. MATS 2007 applied the most conservative standard, which was to count every sampled case in the denominator of the response rate, even those whom could not be contacted because no telephone number was available. Only those few

who were deceased or no longer residing in Minnesota were discounted as ineligible for the survey. This approach produced the weighted response rate of 48.4 percent for the Blue Cross sample.

The MATS Advisory Panel and Westat made every effort to ensure the confidentiality of respondents and to inform them of the features of the survey, its voluntary nature and the confidentiality of their responses. RDD phone numbers and respondent identifiers for the Blue Cross sample were not retained in the analytical data files. Reports cite only aggregate data.

The MATS 2007 questionnaire, data collection and data security plan were reviewed and approved by the Westat Institutional Review Board, a specially constituted review body established to protect the welfare of human subjects recruited to participate in biomedical and behavioral research. Westat's responsibilities are detailed in the regulations concerning human subject protection and the Multiple Project Assurance granted to Westat by the U.S. Department of Health and Human Services, Office for Protection from Research Risks, Division of Human Subject Protection.

Sample Weighting

Sample weights are created so that unbiased population estimates can be calculated using the results of a survey from a sample of a finite population. Sample weights are created for two reasons: 1. to adjust for the probability of selection due to the sampling plan and 2. to post-stratify to the population in order to adjust for non-response and coverage error. MATS 2007 incorporated the demographic characteristics of gender, age, race and education into the weighting.

For MATS 2007, three sets of weights were created: RDD weights, Blue Cross sample weights, and weights for the composite sample that combined the RDD and Blue Cross samples. The RDD weights were created for the responding RDD sample and were benchmarked to Minnesota population totals using the 2005 American Community Survey (ACS) population estimates as their source. The Blue Cross sample weights were created for the responding Blue Cross samples and benchmarked to the Blue Cross sample frame counts. The two files were merged using standard scientific methods. A set of composite weights was then created for

this merged data set for use in producing the Minnesota statewide estimates presented in this report. The creation of the composite weights included the final step of benchmarking them to the ACS population estimates for the state of Minnesota, as was done for the RDD alone, so that the combined data could be used to produce estimates for the entire adult Minnesota population and subgroups of that population.

Using the combined file and composite weights during analysis increased the reliability of survey estimates, compared with using the RDD sample alone. However, the sample sizes do not support reliable tobacco use prevalence rate estimates for specific racial or ethnic groups. Other surveillance efforts employing culturally appropriate research methods have been able to determine specific tobacco use rates within these communities.

MATS 1999 and 2003 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. These surveys generally post-stratify 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, the MATS Advisory Panel and Westat choose to include education as an adjustment factor for MATS 2007. To facilitate the most accurate comparisons between years of MATS administration, the data from MATS 1999 and MATS 2003 were re-weighted to include educational attainment and race. Therefore, estimates from MATS 1999 and 2003 presented in this report may vary slightly from estimates reported in previous publications.

The MATS 2007 survey methodology is fully described in the *Minnesota Adult Tobacco Survey 2007 Methodology Report,* available at www.mnadulttobaccosurvey.org.

Potential Limitations of the Data

All of the MATS 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. Statistics produced from a sample are referred to as "estimates" because they estimate what the actual statistics are for the entire population or for any subgroup in the population. Because there may be some difference between the survey statistic and the actual value for the entire population that the sample survey is meant to represent, statistics produced from sample surveys are subject to two general types of error, technically referred to as "sampling error" and "nonsampling error."

Sampling error is a purely statistical phenomenon. Data are collected from a sample that represents the entire population, rather than from everyone in the population, resulting in an estimate that has some uncertainty associated with it. The uncertainty of an estimate produced from the survey sample data can be quantified. Common measures of uncertainty include standard errors and confidence intervals. See section 1.4.2 for additional information.

Other sources of error, which are typically not possible to quantify, are potential nonsampling errors. One type of nonsampling error to which MATS 2007 was subject is coverage error: the extent to which the frame used to draw the sample does not fully include every member of the population. The weighting process—especially the benchmarking process—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 to more closely conform to the overall Minnesota population. Biases also may be present when people who are missed in the survey differ from those interviewed in ways other than the categories used in weighting. As with most surveys that rely on

telephone interviewing, some subgroups, such as specific racial or ethnic minority communities, are likely to be under-represented.

Other nonsampling errors may result from the survey design, how respondents interpreted questions, how able and willing respondents were to provide accurate answers, and how accurately the answers were recorded and processed. The MATS Advisory Panel and Westat took several steps to minimize these types of errors, including careful questionnaire design, use of existing validated questions, and having multiple individuals review new questions; use of a CATI system to administer the questionnaire and record responses; internal testing of the CATI questionnaire; pilot testing of the instrument and survey procedures; monitoring of the sample and of the collected data throughout data collection; and thorough review of the data file to finalize it for analysis.

1.4.2 Analysis Methodology

Analysis of the MATS data was guided by the MATS 2007 research questions, summarized below. Each research question was addressed as fully as possible in the analysis.

MATS 2007 Research Questions

1. What is the prevalence of tobacco use, cigarette smoking in particular, among adults in Minnesota, and has prevalence changed over time?
2. What are the demographic characteristics of cigarette smokers and nonsmokers in Minnesota?
3. How many smokers in Minnesota are quitting or attempting to quit, and has this number changed over time?
4. How often and where are Minnesotans being exposed to secondhand smoke and has this changed over time?
5. How many young adults in Minnesota are using tobacco and has this changed over time?
6. How are Minnesotans responding to recent changes in the social and structural policy environments that influence tobacco use?

MATS 2007 also sought to describe tobacco-related behaviors and attitudes among African Americans based on the oversample of this group. A separate report on tobacco use in the U.S.-born African American sample that incorporates findings from MATS 2007 with community feedback and interpretation will be prepared.

Analysis Plan

The MATS 2007 analysis plan specified a series of tabulations designed to describe the various data elements related to each research question. There are two main goals of the analysis. First, the analysis describes Minnesota in 2007, based on the MATS 2007 data. Second, the analysis describes tobacco-related trends in Minnesota from 1999 to 2007 (comparing MATS 1999 with MATS 2007) and 2003 to 2007 (comparing MATS 2003 with MATS 2007).

The tabulations have the following features.

MATS 2007 Analysis

The analysis generated frequencies of all key study outcomes. In a few instances, means have been calculated for continuous variables, such as the number of cigarettes smoked in the past 30 days.

Bivariate analyses generated tables displaying the major outcomes by demographic subgroups. Subgroup estimates are presented for age groups, gender, education, income and smoking status (when appropriate). Additional subgroup estimates were generated for the young adult analysis for 30-day smoking status, smoking frequency and college status. All estimates are also presented with 95 percent confidence interval half-widths.

Other bivariate analysis tested the relationship between intermediate outcomes, such as a policy exposure and a key outcome of interest, such as smoking prevalence, quitting behavior or exposure to secondhand smoke. Most of these associations have been previously established in the literature. The purpose of the analysis is not to re-establish these associations but to show their existence in Minnesota. For this reason, the associations presented in this report were not adjusted for demographics or other confounders.

Every estimate has a 95 percent confidence interval half-width, a standard measure of statistical precision that captures the degree of statistical uncertainty associated with various forms of sampling error. A 95 percent confidence interval is likely to contain the real population value 95 percent of the time.

In a few instances, the report refers to numbers of people who fall into a specific group (such as the total number of smokers in Minnesota or all smokers who made a quit attempt) rather than percentages. These counts use the sample weights. The weighting process produces weights that add up to totals for the Minnesota adult population and for the various combinations of gender, age, race and educational level to which the weights were benchmarked. When analyzing any group, it is valid to add up the weights for the survey respondents who fall into the group, to produce a total of all those in the entire state of Minnesota who belong to that group. As in the case of any statistic produced from a sample survey, these weighted counts are survey estimates with associated sampling error.

MATS Trend Analysis

As with the MATS 2007 analysis, estimates from earlier MATS (1999 and 2003) are presented. In a few instances, means have been calculated for continuous variables, such as the number of cigarettes smoked in the past 30 days.

The amount of change between 1999 and 2007, and between 2003 and 2007, is presented for all estimates, with 95 percent confidence interval half-widths for the amount of change.

Subgroup estimates are presented for age groups, gender, education, income and smoking status (when appropriate) for some analyses. Subgroups are only presented where the importance of the question warrants or where subgroups are particularly salient. All subgroup estimates include estimates of change and 95 percent confidence interval half-widths.

Interpretation of Trend Results

MATS is a series of repeated cross-sectional surveys. This means that every MATS survey draws a new sample of the Minnesota population. Repeated cross-sectional surveys are an efficient and useful way to describe characteristics of a population

over time, especially for planning population-level programs and policies. Care is needed, however, when interpreting the results of such surveys. For example, people can and will move in or out of the state, will die and will be born. A repeated cross-sectional survey does not account for the possibility that the changes observed over time could be due to differences in the composition of the population between the survey administrations.

Testing of Differences

A key feature of this report is that statistically significant differences are clearly indicated in figures, tables and text. A difference between two groups or two time points is statistically significant when it is unlikely to have occurred by chance. The differences are always between two groups, for example, men and women, or people with a high school degree and people with a college degree.

A significance test provides a threshold of confidence, a level at which researchers commonly agree that the population values represented by the survey estimates are reliably different from one another. In this report, that threshold is always the 95 percent confidence level.

This report uses two different significance tests. The first test is for examining differences between different subgroups in 2007 (for example, between men and women), and is used for analysis of the 2007 data. The second test is for examining differences between different surveys; for example, between MATS 1999 and MATS 2007, or MATS 2003 and MATS 2007.

MATS 2007 Significance Testing. In the analysis of MATS 2007 data, estimates are compared from independent subgroups within the sample. As described above, one group is always compared with one other group (for example, men compared with women) or multiple series of groups (for example, less than high school education with high school education; less than high school education with some college; less than high school education with college graduates). If the confidence intervals around the two estimates do not overlap, then the difference between the two is statistically significant at the 95 percent level. Significance is not indicated on the table, because there are too many possible comparisons in any given table (as in the education example above). It would be difficult to note all significant differences

among all possible pairs in a straightforward way. Significant differences therefore are mentioned in the text only. This is a conservative test, which may miss a few statistically significant results that could be detected by tests that focus on specific predicted relationships, such as pairwise t-tests.

Results that meet the 95 percent level are the focus of this report.

MATS Trend Significance Testing. In the trend analysis, MATS compares the results from two years (either 1999 and 2007, or 2003 and 2007). To assess whether the difference between surveys is significant, an estimate of the amount of change between the two surveys is calculated and is expressed in the same units as the two estimates (e.g., percentage points in most instances; counts of the analytical unit, such as mean days smoked, in a few instances). The change estimate also has a confidence interval, which is used to determine whether the change between surveys is statistically significant. If the confidence interval of the change estimate does not contain zero, then the change estimate is statistically significant at the 95 percent confidence level. Because these analyses always compare one thing to one other thing, rather than one thing to multiple other things as with the MATS 2007 analyses (for example, a 1999 estimate and a 2007 estimate), it is straightforward and useful to denote significant changes on the trend tables with an asterisk on the table.

Strength of Association

There are some tests of association presented for MATS 2007 results. These tests are designed to determine the extent to which the distribution of one factor is associated with the distribution of another. For example, to test the hypothesis that the distribution of quit attempts is associated with the distribution of workplace smoke-free policies, one might test for the strength of association between the two distributions. This differs from the MATS 2007 significance tests, which examine whether two groups (defined by their characteristics) differ from one another on some common measure (such as quit attempts). The test that is used in MATS to test the strength of association is the Pearson chi-square goodness-of-fit test. When this test is significant, it means that the two distributions under discussion are associated. It does not mean that there is any causal relationship between them; it simply means that they vary together in a predictable way. Significance of these

tests is indicated in the text with a statement in parentheses ($p<0.05$) that indicates that the test was significant at the 95 percent confidence level.

1.5 How This Report Is Organized

Technical Report

This report presents findings from all three MATS with a focus on results from MATS 2007. Chapter 2 discusses the prevalence of smoking among Minnesota adults, and perceptions of tobacco use and the social environment of smoking. Chapter 3 addresses quitting smoking, assistance from health care providers in quitting, and the effects that the price of cigarettes and smoke-free policies have on tobacco use and quitting. Chapter 4 focuses on Minnesotans' exposure to secondhand smoke, describing where these exposures occur, how awareness of secondhand smoke risk has changed, and the relationship between smoke-free policies and these exposures. Finally, chapter 5 discusses smoking among young adults aged 18-24, including young adult smoking prevalence, social environment of smoking, quitting smoking and exposure to secondhand smoke.

Briefings

Five briefings accompany this report:

Tobacco Use in Minnesota Is Declining
Minnesotans Are Quitting Smoking with Help
Smoke-free Policies Protect More Minnesotans
Policies Help Minnesota Smokers Quit
Fewer Young Adult Minnesotans Smoke

Website

The technical report and briefings are available at: www.mnadulttobaccosurvey.org

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Consultants

Juan Jackson, M.A., served on the MATS 2007 Advisory Panel as a representative from the Minnesota African and African American Tobacco Education Network (MAAATEN). The mission of MAAATEN is to engage communities throughout Minnesota to reduce the harm that tobacco causes to people of African descent. Mr. Jackson provided consultation on the African American over-sampling methodology and instrument development.

Michael Davern, Ph.D., is the Research Director of the State Health Access Data Assistance Center at the University of Minnesota. Dr. Davern participated in the sample design, data analysis and reporting tasks for MATS 2003. He supported MATS 2007 through consultation on survey data sampling, weighting and analysis.

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2. Prevalence of Smoking among Minnesota Adults

2.1 Introduction

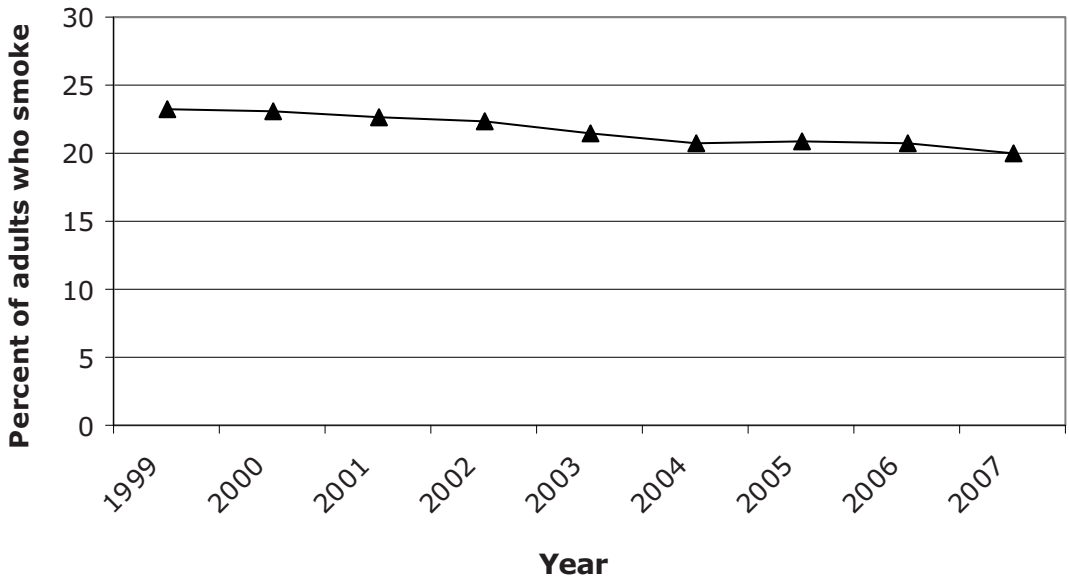
Comprehensive, evidence-based approaches for reducing the initiation of smoking and increasing cessation have been implemented to accelerate the reduction in smoking prevalence rates in the United States.[1] Minnesota tobacco control partners have adopted this comprehensive approach to reduce the prevalence of tobacco use.

These comprehensive programs have proven successful. For example, between 1989 and 1996, prevalence in California—with one of the most comprehensive statewide tobacco control programs in the nation—dropped from 23.3 percent to 18.0 percent, a rate of decline that exceeded the rates observed in the rest of the United States.[2] Other states have implemented similar comprehensive programs, with evidence that investments in state tobacco control programs are independently associated with reductions in adult smoking prevalence.[3]

In the United States, tobacco use rates show a declining trend over time, according to the National Health Interview Survey (NHIS), but appear to have leveled off around 20 percent after a seven-year decline (Figure 2-1), from 1997 to 2004.[4] The rise of many statewide comprehensive tobacco control programs and their subsequent loss of funding provide one potential explanation for this pattern of major decline in adult smoking that was cut short well before meeting the *Healthy People 2010* goal of 10 percent prevalence or less.[5]

ClearWay Minnesota, Blue Cross and MDH have maintained an ongoing investment in reducing the harm caused by tobacco use in Minnesota. Between 2003 and 2007, considerable effort was expended to further reduce the use of tobacco in Minnesota. Several key tobacco control strategies were implemented: increasing the fees on cigarettes by 75 cents; instituting local smoke-free ordinances in multiple cities and counties; conducting ongoing media campaigns to educate the public about the harm of secondhand smoke and to inform smokers of resources to help

Figure 2-1. Prevalence of smoking in the United States, from 1999 to 2007



	1999	2000	2001	2002	2003	2004	2005	2006	2007
Smoking prevalence	23.3	23.1	22.6	22.3	21.5	20.8	20.9	20.8	20.0

Source: National Health Interview Surveys, 1999 to 2007

them quit smoking; and providing unparalleled access to quit-smoking services. Regardless of insurance status, there are a multitude of in-person, telephone and web-based services to help Minnesota tobacco users quit.

This chapter examines the prevalence of tobacco use in Minnesota and the characteristics of cigarette smokers. Section 2.2 focuses on tobacco use, beginning with cigarette smoking, the most common form of tobacco use, and continuing to other forms, such as pipes, cigars, smokeless tobacco and hookahs. Section 2.3 provides an overview of the characteristics of cigarette smokers, including their individual and tobacco use characteristics as well as their social environments.

In this report, the terms "smoking" and "smoker" apply to cigarette smoking unless otherwise noted.

Each section begins with a description of the environment in 2007 and ends with an examination of changes between 1999 and 2007 and between 2003 and 2007.

Changes are not discussed if the comparisons are not feasible (e.g., the same data were not collected at the different time points) or if the comparisons are not particularly important or interesting.

2.2 Tobacco Use in Minnesota

This section looks at tobacco use in Minnesota from several perspectives. The main focus is on cigarette smoking because the overwhelming majority of tobacco users are cigarette smokers. There is also a brief discussion of other forms of tobacco use. The report depicts the demographic characteristics of Minnesota's adults in terms of cigarette smoking status and other tobacco use. It then explores the demographics and health status of smokers, physiological aspects such as addiction level and smoking intensity, perceptions about smoking and tobacco, and various facets of the social context of smoking.

2.2.1 Use of Cigarettes

Cigarette smoking is by far the most common form of tobacco use in the United States. While all forms of tobacco use have negative health consequences, cigarettes have the greatest impact on health in the United States of all tobacco products. Cigarette smoking causes death primarily through lung cancer, respiratory obstruction and heart disease.[6] Approximately 8.6 million current and former smokers suffer from one or more tobacco-related diseases.[7] Smoking annually costs the U.S. economy over $75.5 billion in medical expenses and $92 billion in lost productivity.[8] Among Minnesotans, smoking led to over 5,600 premature deaths, $1.98 billion in medical expenses and $1.5 billion in lost productivity in 2002, the most recent period studied.[9]

The MATS 2007 report presents a general profile of cigarette smoking in Minnesota by comparing current smokers, former smokers and never smokers.

Smoking Status

In this report, adult smoking status is defined according to the standard definition used by the CDC[10] and most smoking studies:

- A **current smoker** has smoked at least 100 cigarettes in his or her lifetime and now smokes every day or some days.
- A **former smoker** has smoked at least 100 cigarettes in his or her lifetime but now does not smoke at all.
- A **never smoker** has not smoked at least 100 cigarettes in his or her lifetime.

Never smokers and all former smokers are sometimes collectively referred to as **nonsmokers** in this report.

Survey Questions

- Have you smoked at least 100 cigarettes in your entire life?
- Do you now smoke cigarettes every day, some days or not at all?

Among all adult Minnesotans, 17.0±1.4 percent are current smokers, 25.1±1.3 percent are former smokers and 57.9±1.6 percent are never smokers (Figure 2-2). Detailed statistics for the following discussions of these three groups appear in Table 2-1.

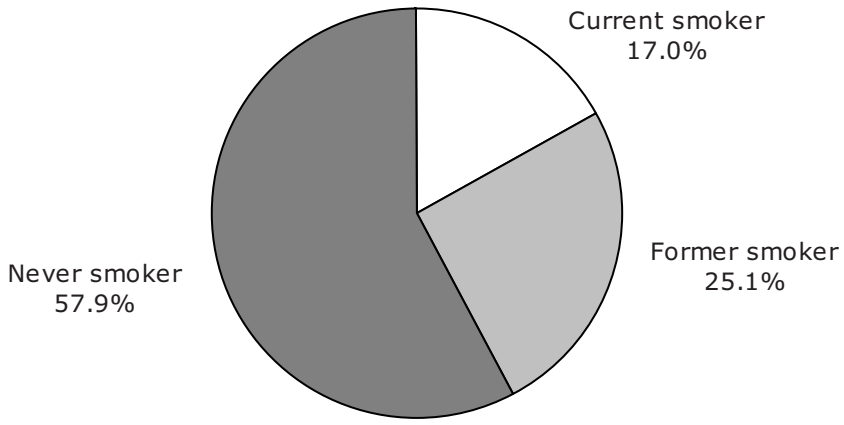
Current Smokers

Overall, 17.0±1.4 percent of adult Minnesotans (about 634,000 people) are current smokers (Table 2-1). This prevalence compares favorably with the 20.0 percent smoking prevalence for all states as of 2007, as reported in the NHIS.

Current smokers in Minnesota display the commonly observed demographic patterns as consistently noted in the literature.[11] Higher smoking rates occur among those who are male, younger, less well educated and have lower incomes.

Men are more likely to smoke than women. Minnesota men currently smoke at a rate of 18.6±2.1 percent, compared with 15.5±1.8 percent for women.

Figure 2-2. Smoking status of Minnesota adults, 2007



Source: Minnesota Adult Tobacco Survey, 2007

Table 2-1. Smoking status of Minnesota adults, by selected demographic characteristics

Characteristics	Current smoker	Former smoker	Never smoker	Row total
	%	%	%	%
Overall	**17.0** ± 1.4	**25.1** ± 1.3	**57.9** ± 1.6	**100**
Age				
18 to 24	**21.5** ± 4.4	**5.5** ± 2.4	**73.0** ± 4.7	**100**
25 to 44	**19.5** ± 2.7	**17.9** ± 2.2	**62.6** ± 3.0	**100**
45 to 64	**17.6** ± 2.0	**31.8** ± 2.1	**50.6** ± 2.3	**100**
65 or older	**6.0** ± 1.3	**43.9** ± 2.4	**50.0** ± 2.4	**100**
Gender				
Female	**15.5** ± 1.8	**23.6** ± 1.6	**61.0** ± 2.0	**100**
Male	**18.6** ± 2.1	**26.7** ± 2.0	**54.7** ± 2.5	**100**
Education				
Less than high school	**26.3** ± 7.0	**26.1** ± 4.8	**47.6** ± 6.4	**100**
High school graduate/GED	**24.3** ± 3.1	**27.9** ± 2.7	**47.8** ± 3.3	**100**
Some college or technical school	**17.7** ± 2.2	**24.2** ± 2.6	**58.2** ± 2.8	**100**
College graduate or beyond	**5.9** ± 1.2	**23.2** ± 1.9	**70.9** ± 2.1	**100**
Household income				
$35,000 or less	**23.2** ± 2.9	**24.1** ± 2.4	**52.7** ± 3.3	**100**
$35,001 to $50,000	**20.9** ± 4.4	**28.6** ± 3.7	**50.4** ± 4.5	**100**
$50,001 to $75,000	**17.8** ± 3.1	**25.6** ± 3.0	**56.6** ± 3.6	**100**
$75,001 or more	**11.0** ± 2.0	**23.3** ± 2.1	**65.8** ± 2.6	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Smoking rates decline as age increases. Young adults (18-24-year-olds) in Minnesota have the highest current smoking rate among all age groups, at 21.5±4.4 percent. The smoking rates consistently decline across the age groups, with only 6.0±1.3 percent of those 65 or older being smokers. However, the only statistically significant differences observed occur between this oldest group and each of the other three age groups. The various factors that contribute to this phenomenon will be discussed in chapters 3 and 5. Briefly, social and tobacco industry marketing forces put pressure on young adults to smoke,[12] and quit rates are low among young adult smokers. Successful sustained quitting often requires repeated quit attempts, making successful quitting more likely among older age groups. Further, smoking-related illnesses cause older smokers to die at younger ages than nonsmokers in the same age group.

Smoking rates decline as education increases. Among Minnesotans with less than a high school education, 26.3±7.0 percent are current smokers while only 5.9±1.2 percent of those who have a college degree smoke. Those with a college degree differ from each of the other three educational status groups in a statistically significant way.

Smoking rates decline as income increases. Among Minnesotans with annual household incomes of $35,000 or less, 23.2±2.9 percent are current smokers, steadily declining to 11.0±2.0 percent of those with household incomes above $75,000. Only the differences between the highest income group and the other three income groups are statistically significant.

Former Smokers

Due to the addictive nature of tobacco and many factors in the social environment, those attempting to quit smoking have varying degrees of success. Surveillance studies such as MATS use the term "former smoker" to describe someone who has smoked at least 100 cigarettes in his or her lifetime but who is not currently smoking. This definition does not consider the length of time that the person has gone without smoking a cigarette. The term also ignores the psychological, physical, behavioral and environmental factors that may weaken or support

maintenance of the quit status, which will be discussed in chapter 3. The present section focuses on the demographic characteristics of former smokers.

Overall, 25.1±1.3 percent of adult Minnesotans (about 936,000 people) are former smokers (Table 2-1). Men and women do not differ. As in the case of current smokers, there is a marked pattern across the age groups: 5.5±2.4 percent of 18-24-year-olds are former smokers, ranging up to 43.9±2.4 percent of those 65 or older as former smokers. All differences between age groups are statistically significant. Neither education nor income groups differ in the prevalence of former smokers.

Interpreting the Data about Former Smokers: the Quit Ratio. Drawing conclusions about quitting behaviors within demographics based on the prevalence of former smokers poses challenges. To be a former smoker, it is necessary to have once been a smoker. Thus, the percentage of former smokers in any group is partly a function of the number of people in the group who have ever been smokers. Viewed in isolation, relative percentages of former smokers across groups can be misleading. A smaller percentage in one group compared with another may be due to a smaller percentage of individuals who have ever been smokers and not to a lower quit rate. For example, college graduates have the lowest smoking rates and highest rates of never smoking, yet the rate of former smokers among college graduates is about the same as all other educational groups. These findings alone cannot be interpreted to mean that college graduates quit smoking at about the same rate as the other groups. Since fewer smokers exist among the college educated, fewer can become former smokers.

Unless the lifetime incidence of ever smoking is consistent across the groups being compared, the better comparison is the quit ratio.

Ever Smoker and Quit Ratio

Ever smokers are defined as the sum total of current smokers and former smokers.

Quit ratio is defined as the proportion (expressed as a percentage) of ever smokers who are former smokers at a given time. This ratio can be calculated for the entire population or for any subgroup.

The quit ratio is calculated as:

The total number of former smokers, divided by the sum of the total number of current smokers plus the total number of former smokers.

The quit ratio is a snapshot of whether those who have ever smoked are currently smoking or not. When compared over different points in time, the quit ratio characterizes the smoking or former smoking status of the total ever-smoking population and provides better information to monitor cessation trends.

The quit ratio is a simple concept, but is somewhat confounded by survivor bias in the case of age groups. Smokers die at younger ages than nonsmokers, an effect realized mainly in later years. Younger people are less likely to be successful quitters than older smokers, in part because successful quitting usually requires repeated quit attempts. Consequently, the pool of smokers (and therefore of ever smokers) will tend to diminish faster in older age groups than in younger age groups. Therefore, former smokers tend to dominate in the pool of ever smokers as an age cohort grows older.

Under the MATS definition, the group of former smokers includes those who have been quit for a short time—even one day—as well as those who have been quit for decades, and all those in between. Three-quarters of the former smokers who are 65 or older have gone at least 10 years without smoking regularly, and less than 3 percent have smoked regularly within the past 12 months. However, 37 percent of former smokers in the 18-24-year-old group have smoked regularly within the past 12 months.*

Overall, the quit ratio for ever smokers in Minnesota is 59.6±2.6 percent (Table 2-2). Men and women do not differ. Predictably, the quit ratio increases consistently with age, education and income, consistent with the decreasing smoking rates associated with these characteristics. It ranges from 20.4±8.3 percent for 18-24-year-olds to 88.0±2.5 percent for those 65 or over, from 49.8±9.6 percent for those with less than a high school degree to 79.7±3.7 percent for college graduates, and from 50.9±4.5 percent for those with household incomes of $35,000 or less to 68.0±4.7 percent for incomes above $75,000.

Never Smokers

Overall, 57.9±1.6 percent of adult Minnesotans (about 2.2 million people) have not smoked at least 100 cigarettes in their lifetime and are defined as never smokers (Table 2-1). Few people take up smoking after the years of young adulthood.[13]

With the exception of age, never smoking rates mirror those for current smoking when examined within various groups: the lower the current smoking rates, the higher the rate of never smoking.

A higher percentage of women (61.0±2.0 percent) are never smokers compared with men (54.7±2.5 percent), a statistically significant difference.

* MATS 2007 did not determine the length of time without any smoking at all, but the regular smoking measure is a reasonable indicator of the relative duration of how long someone has been quit.

Table 2-2. Quit ratios of ever smokers, by selected demographic characteristics

Characteristics	Quit ratio %
Overall	**59.6** ± 2.6
Age	
18 to 24	**20.4** ± 8.3
25 to 44	**48.0** ± 5.3
45 to 64	**64.4** ± 3.5
65 or older	**88.0** ± 2.5
Gender	
Female	**60.4** ± 3.7
Male	**59.0** ± 3.6
Education	
Less than high school	**49.8** ± 9.6
High school graduate/GED	**53.5** ± 4.6
Some college or technical school	**57.7** ± 4.0
College graduate or beyond	**79.7** ± 3.7
Household income	
$35,000 or less	**50.9** ± 4.5
$35,001 to $50,000	**57.8** ± 7.0
$50,001 to $75,000	**59.1** ± 5.8
$75,001 or more	**68.0** ± 4.7

Source: Minnesota Adult Tobacco Survey, 2007

The prevalence of never smoking decreases as age increases. Young adults have the highest rate of never smoking among all age groups, at 73.0±4.7 percent. Among Minnesotans 45 or older, 50.6±2.3 percent have maintained their status as never smokers. All differences between age groups for never smoking are statistically significant, except between the 45-64-year-old group and those 65 or older. Both current smoking and never smoking rates decline as age increases, while the percentage of former smokers increases, as discussed previously.

The prevalence of never smoking increases as education increases. Among Minnesotans with less than a high school education, 47.6±6.4 percent are never smokers, compared with 70.9±2.1 percent of those with a college degree. All of the differences between educational levels for never smoking are statistically significant, except between those with less than a high school degree and those with only a high school degree.

The prevalence of never smoking increases as income increases. Among Minnesotans with annual household incomes of $35,000 or less, 52.7±3.3 percent are never smokers, and 65.8±2.6 percent of those with household incomes above $75,000 are never smokers. Only the differences between those with incomes greater than $75,000 and each of the other income levels are statistically significant.

2.2.2 Use of Non-Cigarette Tobacco Products: Pipes, Cigars, Smokeless Tobacco and Hookah

The success of tobacco control efforts in increasing cigarette excise taxes and restricting cigarette advertising has led to increased efforts by the tobacco industry to aggressively market alternative tobacco products. Traditional products, such as cigars, and new products, such as oral moist snuff, are overtly or suggestively marketed as "safer" despite evidence that these alternative tobacco forms are addictive and harmful.[14] Further, the increase in smoke-free public places in Minnesota may result in increased use of smokeless tobacco. For this reason, MATS monitors the use of these non-cigarette forms of tobacco.

Use of Non-Cigarette Tobacco Products among all Minnesotans

In 2007, 6.1±0.8 percent of Minnesotans were current users of one or more non-cigarette tobacco products (Table 2-3). Miscellaneous tobacco products such as bidis and kreteks[†] are reflected in this overall non-cigarette tobacco use statistic, but are not discussed separately in this chapter because the prevalence of use is so small. Conversely, hookah is discussed but not included in this overall statistic. Hookah use is an emerging phenomenon. As a result of a recent modest swell in popularity of hookahs, particularly among young adults, MATS 2007 assessed hookah use for the first time in the MATS series. To preserve comparisons with the first two MATS, hookah use has been excluded from the non-cigarette use definition.

[†] A bidi is a cigarette made by rolling tobacco by hand in a dried leaf from the tendu tree. Most bidis are made in India and they come in different flavors. A kretek is a cigarette made of a mixture of tobacco and clove. Bidis and kreteks are excluded from this analysis because of low prevalence and because they are used mainly by adolescents who are not surveyed in MATS.

Non-Cigarette Tobacco Use Status

For MATS, users of non-cigarette tobacco products are classified similarly to cigarette smokers, as current, former and never users of each product type. The definitions are different for these products.

- A **current user** has used the product at least 20 times in his or her life and has also used it at least one day in the past 30 days.
- A **former user** has used the product at least 20 times in his or her life and has not used it any day in the past 30 days.
- A **never user** has used the product fewer than 20 times in his or her life.

Survey Questions

- Have you [smoked tobacco in a pipe / smoked cigars or cigarillos / used smokeless tobacco or snuff / used any other tobacco product, for example bidis or kreteks] at least 20 times in your life?
- During the past 30 days, how many days did you [smoke tobacco in a pipe / smoke cigars or cigarillos / use smokeless tobacco or snuff / use these other tobacco products]?

Hookah Use Status

A hookah is a single or multi-stemmed (often glass) water pipe device for smoking that operates by water filtration and indirect heat. Hookah use is classified only as to whether someone is a current hookah user or not.

- A **current user** has used a hookah to smoke tobacco at least one day in the past 30 days.
- Anyone else is not a current user.

Survey Questions

- Have you ever smoked tobacco using a hookah water pipe?
- During the past 30 days, how many days did you use a hookah to smoke tobacco?

Table 2-3. Non-cigarette tobacco use by all Minnesota adults and by current smokers, by gender

Population	Any non-cigarette[†] tobacco use	Pipe use	Cigar use	Smokeless tobacco use	Hookah use
	%	%	%	%	%
Minnesota adults	**6.1** ± 0.8	**0.5** ± 0.3	**2.8** ± 0.6	**3.1** ± 0.6	**0.4** ± 0.2
Female	**0.6** ± 0.4	**0.0** ± 0.0	**0.2** ± 0.1	**0.3** ± 0.4	**0.3** ± 0.3
Male	**11.8** ± 1.6	**1.0** ± 0.6	**5.4** ± 1.1	**6.0** ± 1.1	**0.6** ± 0.3
Current smokers	**11.9** ± 2.8	**0.9** ± 0.6	**7.5** ± 2.4	**4.4** ± 1.6	**1.5** ± 1.2
Female	**2.0** ± 1.1	**0.0** ± 0.0	**1.1** ± 0.8	**0.4** ± 0.5	**1.0** ± 1.8
Male	**20.4** ± 4.9	**1.7** ± 1.2	**13.0** ± 4.3	**7.8** ± 3.0	**1.9** ± 1.6

[†] Hookah use is not included in the general measure of non-cigarette tobacco use.

Source: Minnesota Adult Tobacco Survey, 2007

Among the gender, age, education and income groups, the only important variation in the use of these forms occurs between men and women; accordingly, Table 2-3 breaks out the overall statistics by gender as well. Use of non-cigarette tobacco occurs almost exclusively among men, 11.8±1.6 percent of whom use some such form of tobacco.

Minnesotans use pipes, cigars and smokeless tobacco at very low rates. Overall, 3.1±0.6 percent of Minnesotans use some form of smokeless tobacco, such as chewing tobacco or snuff; nearly all smokeless tobacco users are men (6.0±1.1 percent). The prevalence of cigar smoking is also fairly low at 2.8±0.6 percent, nearly all of it by men (5.4±1.1 percent). Less than one-half of 1 percent (0.5±0.3 percent) of Minnesotans currently smoke tobacco in pipes, and essentially all of them are men (1.0±0.6 percent). Only 0.4±0.2 percent of Minnesotans are current hookah users. Although hookahs can be used for many substances, MATS 2007 addressed only the smoking of tobacco in hookahs.

Hookah use varies little by gender, age, education and income, except for much higher usage by young adults. The 2.9±1.8 percent of young adults who are current hookah users (not shown in table) represent nearly all such users. It is also important to keep in mind that a single use of a hookah in the past 30 days is enough to classify someone as a hookah user for purposes of this study. This finding is most useful as a baseline for tracking potential increases in hookah use.

Use of Pipes, Cigars, Smokeless Tobacco and Hookah among Current Cigarette Smokers

Typically, use of non-cigarette tobacco products is more common among cigarette smokers than nonsmokers (Table 2-3). Possible explanations for this tendency include using smokeless tobacco when smoking is not possible or using the alternative forms in hopes of reducing or quitting cigarettes. Caution is advised in using the statistics for current smokers in Table 2-3: since the prevalence is so low, the percentages are small and the confidence intervals are large relative to the percentages.

Overall, 11.9±2.8 percent of cigarette smokers also use some other form of tobacco, which is about double the prevalence among all Minnesotans. The only statistically significant difference among the demographic groups occurs between men and women; 20.4±4.9 percent of male smokers use some other form of tobacco, while only 2.0±1.1 percent of female smokers do so.

Among current cigarette smokers, a mere 0.9±0.6 percent also smoke pipes, about double the prevalence for the whole Minnesota population. Only 4.4±1.6 percent of cigarette smokers also use smokeless tobacco, about half again as high as the prevalence for all Minnesotans. Nearly all of them are men. As with other tobacco forms, hookah use is higher among cigarette smokers (1.5±1.2 percent) than in the general population.

Minnesotans' Use of Tobacco Products (All Forms)

Another way of looking at the prevalence of tobacco use is to consider how many people use tobacco in *any* form. This measure provides a clear picture of the full extent of tobacco use among adult Minnesotans.

Overall, 21.1±1.5 percent of Minnesotans currently use some form of tobacco, including cigarettes, pipes, cigars, smokeless or other forms (Table 2-4).‡ As previously mentioned, 17.0±1.4 percent of Minnesotans are current cigarette smokers. Thus, 4.1 percent of Minnesotans use tobacco exclusively in non-cigarette

‡ This statistic does not include the few hookah users who do not also use some other form of tobacco, in order to be consistent with the data from earlier MATS surveys.

forms. Further, over 80 percent of all Minnesota tobacco users currently smoke cigarettes, further demonstrating why tobacco control efforts focus most of their resources on cigarette use. Table 2-4 shows that 6.4±1.5 percent of former smokers and 4.2±1.0 percent of never smokers currently use tobacco in some form other than cigarettes.

Table 2-4. Current use of any tobacco product (excluding hookah), by selected demographic characteristics

Characteristics	Current use %
Overall	**21.1** ± 1.5
Age	
18 to 24	**27.1** ± 4.8
25 to 44	**24.5** ± 2.9
45 to 64	**21.0** ± 2.1
65 or older	**8.2** ± 1.5
Gender	
Female	**15.8** ± 1.9
Male	**26.7** ± 2.3
Education	
Less than high school	**31.5** ± 7.0
High school graduate/GED	**27.5** ± 3.1
Some college or technical school	**22.9** ± 2.4
College graduate or beyond	**9.5** ± 1.6
Household income	
$35,000 or less	**26.2** ± 3.1
$35,001 to $50,000	**25.0** ± 4.5
$50,001 to $75,000	**22.1** ± 3.3
$75,001 or more	**16.2** ± 2.2
Smoking status	
Current smokers	**100.0** ± 0.0
Former smokers	**6.4** ± 1.5
Never smokers	**4.2** ± 1.0

Source: Minnesota Adult Tobacco Survey, 2007

The demographic patterns for use of any tobacco product are similar to those already presented for current cigarette smoking because cigarette smokers constitute the largest percentage of all tobacco users. Since only men use non-cigarette tobacco to any degree, the small difference in the percentages of women and men who are cigarette smokers (15.5 percent and 18.6 percent) becomes much wider and statistically significant for the use of any tobacco product (15.8±1.9 percent and 26.7±2.3 percent).

2.2.3 Tobacco Use in Minnesota, 1999 to 2007

Trends in Minnesota and the United States

This section discusses the changes in prevalence over time in the Minnesota adult population, using the MATS data. Measurements were taken at 1999, 2003 and 2007. As noted in chapter 1, these are three repeated cross-sections, or snapshots, of the population at each time point, rather than a longitudinal cohort following the same people over time. Comparisons between an age subgroup, for example, will include a different group of respondents of the same age during each year.

As illustrated in Figure 2-3, both national and Minnesota prevalence rates are declining over time. The National Health Interview Survey data show a downward trend that appears to have leveled off at about 20 percent from 2004 through 2007.[15] Minnesota's rate, however, has declined significantly from 1999 through 2007 from 22.1±1.7 percent to 17.0±1.4 percent, a change of 5.1±2.2 percent. This significant decline in Minnesota has occurred even as the national rate has stalled. Minnesota therefore has been able to make notable progress in reducing the prevalence of tobacco use at a time when the nation has shown only incremental reductions.

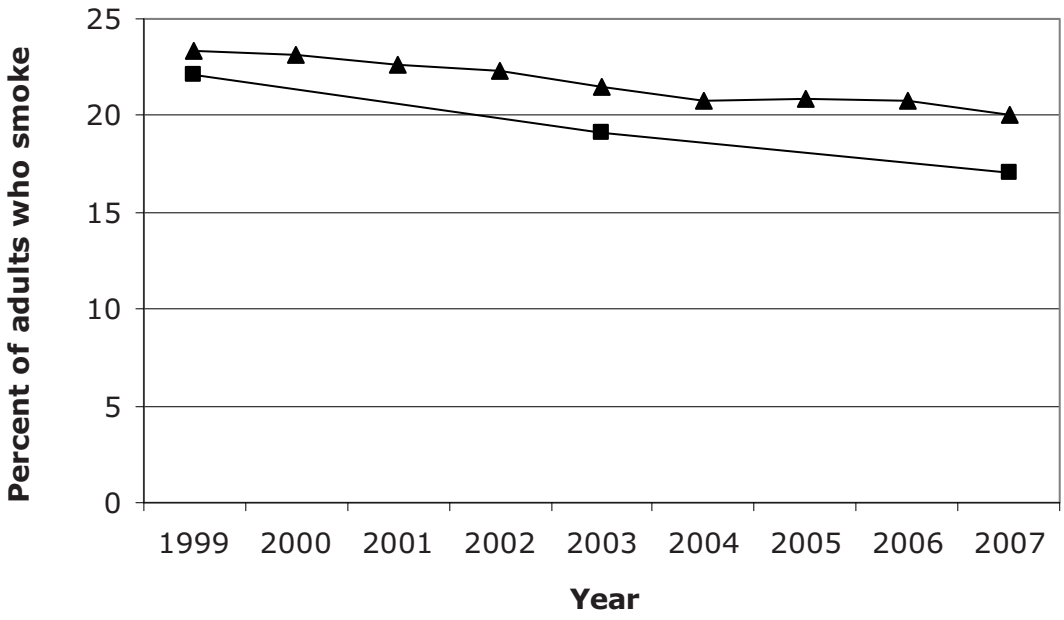
Use of Cigarettes, 1999 to 2007

Between 1999 and 2007, the percentage of adults in Minnesota who are current smokers declined from 22.1±1.7 percent to 17.0±1.4 percent (Figure 2-4). This reduction of 5.1±2.2 percentage points is statistically significant. The total number of current smokers fell from 798,000 in 1999 to 634,000 in 2007. The 2007 prevalence also represents a statistically significant drop of 2.1±2.1 points[§] from the 2003 rate of 19.1±1.5 percent. The percentage of Minnesotans who have never smoked increased at about the same rate as the smoking prevalence decreased, rising by 5.8±2.6 points, from 52.1±2.1 percent in 1999 to 57.9±1.6 percent in 2007. Similarly, the increase in never smokers from 2003 to 2007 was 2.5±2.4 points. Both changes are statistically significant. There was little change in the percentage of Minnesotans who are former smokers, holding steady at approximately one-quarter of the

[§] As presented in the text, the confidence interval includes zero and does not appear to be significant; however, when carried out to additional decimal places, the confidence interval does not include zero.

population. As discussed previously, this statistic is better interpreted by use of the quit ratio in the overall population, rather than as an isolated number. Detailed statistics for the following discussions of these three groups appear in Tables 2-5, 2-6 and 2-8.

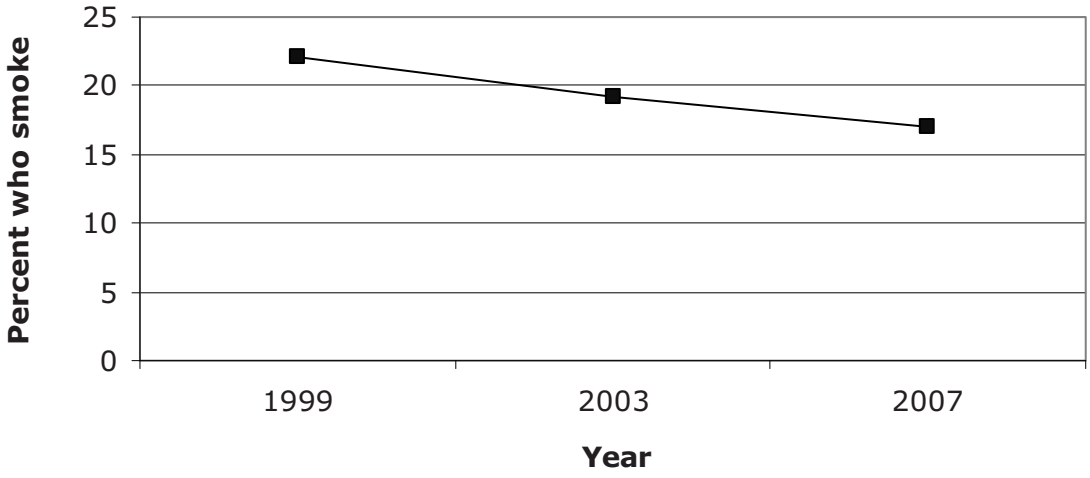
Figure 2-3. Smoking prevalence rates in U.S. and Minnesota surveillance studies, from 1999 to 2007



Survey	1999	2000	2001	2002	2003	2004	2005	2006	2007
U.S.	23.3	23.1	22.6	22.3	21.5	20.8	20.9	20.8	20.0
Minnesota	22.1				19.1				17.0

Source: National Health Interview Surveys 1999 to 2007; Minnesota Adult Tobacco Surveys 1999 to 2007

Figure 2-4. Prevalence of smoking in Minnesota, from 1999 to 2007



				Change over time	
	1999	2003	2007	1999 to 2007	2003 to 2007
Percent who smoke	22.1 ± 1.7	19.1 ± 1.5	17.0 ± 1.4	-5.1 ± 2.2 %*	-2.1 ± 2.1 %*

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Current Smokers. Smoking rates for men and women showed about the same statistically significant decline over each time period as the general adult population (Table 2-5).

Table 2-5. Current smokers among all Minnesota adults from 1999 to 2007, by selected demographic characteristics

Characteristics	1999	2003	2007	Change over time	
				1999 to 2007	2003 to 2007
	%	%	%	%	%
Overall	**22.1** ± 1.7	**19.1** ± 1.5	**17.0** ± 1.4	**-5.1** ± 2.2 *	**-2.1** ± 2.1 *
Age					
18 to 24	**34.2** ± 6.5	**29.3** ± 4.0	**21.5** ± 4.4	**-12.7** ± 7.8 *	**-7.8** ± 5.9 *
25 to 44	**25.7** ± 2.7	**22.0** ± 2.9	**19.5** ± 2.7	**-6.2** ± 3.8 *	**-2.5** ± 4.0
45 to 64	**20.1** ± 2.9	**17.7** ± 2.4	**17.6** ± 2.0	**-2.6** ± 3.6	**-0.1** ± 3.2
65 or older	**6.9** ± 2.5	**6.5** ± 1.6	**6.0** ± 1.3	**-0.9** ± 2.8	**-0.5** ± 2.1
Gender					
Female	**20.3** ± 2.2	**16.9** ± 2.0	**15.5** ± 1.8	**-4.8** ± 2.9 *	**-1.4** ± 2.7
Male	**24.0** ± 2.6	**21.5** ± 2.3	**18.6** ± 2.1	**-5.3** ± 3.4 *	**-2.9** ± 3.1
Education					
Less than high school	**24.0** ± 5.5	**20.4** ± 4.8	**26.3** ± 7.0	**2.3** ± 8.8	**5.9** ± 8.4
High school graduate/GED	**28.0** ± 3.3	**26.1** ± 3.1	**24.3** ± 3.1	**-3.8** ± 4.5	**-1.8** ± 4.4
Some college or technical school	**24.8** ± 3.3	**20.5** ± 3.0	**17.7** ± 2.2	**-7.1** ± 4.0 *	**-2.8** ± 3.7
College graduate or beyond	**10.4** ± 2.2	**9.4** ± 1.6	**5.9** ± 1.2	**-4.5** ± 2.5 *	**-3.5** ± 2.0 *

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Over both time periods, younger adults showed greater declines in smoking prevalence than older adults, especially the 18-24-year-olds, who showed a sizable drop of 12.7±7.8 points from 1999 to 2007, and 7.8±5.9 points from 2003 to 2007. The 25-44-year-old group also declined notably, by 6.2±3.8 points between 1999 and 2007. The changes across both time periods are statistically significant for the two younger age groups, except for the 25-44-year-old group from 2003 to 2007.

Among educational groups, the largest decline, 7.1±4.0 points, occurred from 1999 to 2007 among those who had at least some college or technical school. Among college graduates, smoking prevalence declined by 4.5±2.5 points, falling from 10.4±2.2 percent in 1999, to 5.9±1.2 percent in 2007. A relatively sizable decline (3.5±2.0 points) for the college graduates also occurred between 2003 and 2007, sustaining their downward trend. All of the foregoing declines are statistically significant.

None of the other changes presented in Table 2-5 are significant; however, it must be noted that the point estimates for those with less than a high school education appear to increase from 1999 to 2007 and more so from 2003 to 2007. While these increases are not statistically significant, this remains an important group to monitor.

Former Smokers. There are virtually no significant changes over time in the percentages of former smokers in the overall Minnesota population or across subgroups by gender, age and education (Table 2-6).

Table 2-6. Former smokers among all Minnesota adults from 1999 to 2007, by selected demographic characteristics

Characteristics	1999	2003	2007	Change over time	
				1999 to 2007	2003 to 2007
	%	%	%	%	%
Overall	**25.8** ± 1.8	**25.5** ± 1.4	**25.1** ± 1.3	**-0.7** ± 2.2	**-0.4** ± 1.9
Age					
18 to 24	**10.8** ± 5.0	**8.6** ± 2.3	**5.5** ± 2.4	**-5.3** ± 5.6	**-3.1** ± 3.3
25 to 44	**17.6** ± 2.3	**16.5** ± 2.0	**17.9** ± 2.2	**0.3** ± 3.2	**1.5** ± 3.0
45 to 64	**36.7** ± 3.6	**35.1** ± 2.8	**31.8** ± 2.1	**-5.0** ± 4.2 *	**-3.4** ± 3.5
65 or older	**38.6** ± 4.8	**42.5** ± 3.3	**43.9** ± 2.4	**5.3** ± 5.3 *	**1.5** ± 4.1
Gender					
Female	**22.7** ± 2.3	**22.4** ± 1.8	**23.6** ± 1.6	**0.9** ± 2.8	**1.2** ± 2.4
Male	**29.0** ± 2.8	**28.7** ± 2.2	**26.7** ± 2.0	**-2.3** ± 3.4	**-2.0** ± 3.0
Education					
Less than high school	**29.6** ± 5.7	**26.3** ± 5.7	**26.1** ± 4.8	**-3.5** ± 7.4	**-0.2** ± 7.5
High school graduate/GED	**26.8** ± 3.2	**27.5** ± 2.7	**27.9** ± 2.7	**1.1** ± 4.2	**0.4** ± 3.8
Some college or technical school	**23.9** ± 3.1	**24.5** ± 2.4	**24.1** ± 2.2	**0.2** ± 3.8	**-0.3** ± 3.3
College graduate or beyond	**25.5** ± 3.5	**24.2** ± 2.3	**23.2** ± 1.9	**-2.3** ± 4.0	**-1.1** ± 3.0

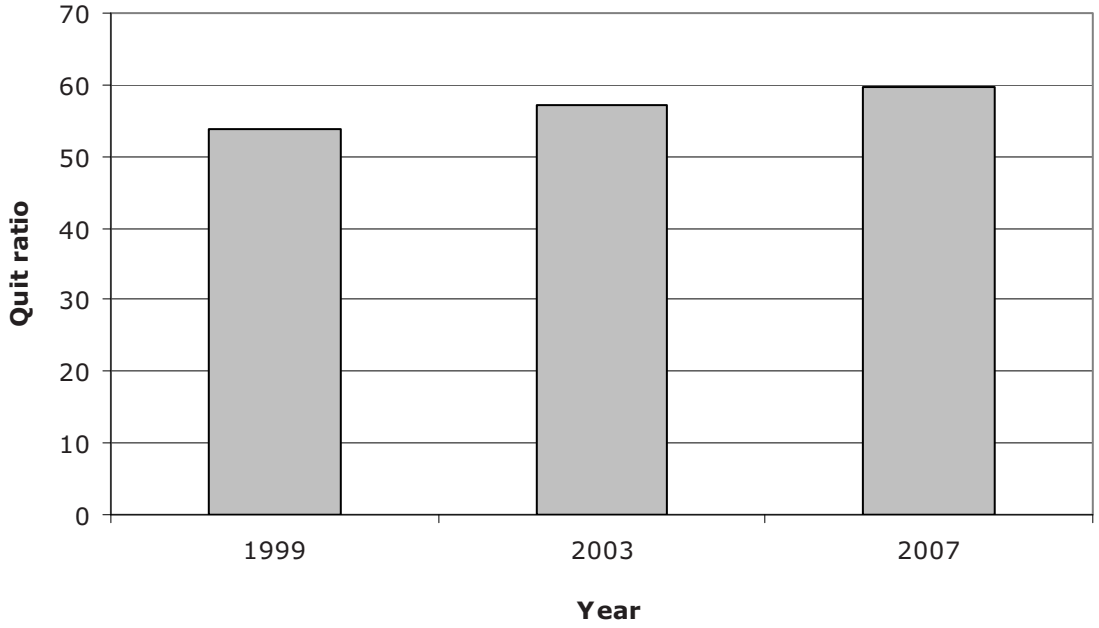
*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Quit Ratio**.** As noted in section 2.2.1, the quit ratio characterizes the smoking or former smoking status of the total ever smoking population and provides some information to monitor trends in cessation.

From 1999 to 2007, the quit ratio increased by a statistically significant 5.7±2.2 percentage points, from 53.9±2.9 percent to 59.6±2.6 percent (Figure 2-5). As previously discussed, numerous complex factors affect the quit ratio and, even more, its change over time. Changes in both individuals' smoking behavior and the population composition over time may affect the ratio. Still, at the population level, a statistically significant higher percentage of people who have ever smoked are currently no longer smoking in 2007 than in 1999. This trend is consistent: the 2.5±1.9 point increase from the 57.1±2.6 percent quit ratio in 2003 to the 2007 rate is also statistically significant.

Figure 2-5. Comparison of quit ratios, from 1999 to 2007



				Change over time	
	1999	**2003**	**2007**	**1999 to 2007**	**2003 to 2007**
Quit ratio	53.9 ± 2.9	57.1 ± 2.6	59.6 ± 2.6	5.7 ± 2.2 %*	2.5 ± 1.9 %*

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

The increase in the quit ratio from 1999 to 2007 was statistically significant for both men and women, with women showing an increase of 7.6±2.8 points (Table 2-7). The quit ratio increased 7.3±3.2 points among 25-44-year-olds between 1999 and 2007, a statistically significant increase. The groups with some college or a college degree showed statistically significant increases in the quit ratios over both time periods, with each increasing by nearly 9 points from 1999 to 2007. The college graduates increased the most (about 8 percent) from 2003 to 2007.

Table 2-7. Quit ratios from 1999 to 2007 among ever smokers, by selected demographic characteristics

Characteristics	1999	2003	2007	Change over time	
				1999 to 2007	2003 to 2007
	%	%	%	%	%
Overall	**53.9** ± 2.9	**57.1** ± 2.6	**59.6** ± 2.6	**5.7** ± 2.2*	**2.5** ± 1.9*
Age					
18 to 24	**24.0** ± 10.1	**22.7** ± 5.6	**20.4** ± 8.3	**-3.6** ± 5.6	**-2.2** ± 3.3
25 to 44	**40.7** ± 4.4	**42.8** ± 4.8	**48.0** ± 5.3	**7.3** ± 3.2*	**5.2** ± 3.0*
45 to 64	**64.6** ± 4.7	**66.6** ± 3.9	**64.4** ± 3.5	**-0.2** ± 4.2	**-2.2** ± 3.5
65 or older	**84.9** ± 5.2	**86.7** ± 3.1	**88.0** ± 2.5	**3.1** ± 5.3	**1.3** ± 4.1
Gender					
Female	**52.8** ± 4.2	**57.1** ± 3.8	**60.4** ± 3.7	**7.6** ± 2.8*	**3.4** ± 2.4*
Male	**54.8** ± 4.1	**57.2** ± 3.5	**58.9** ± 3.6	**4.1** ± 3.4*	**1.7** ± 3.0
Education					
Less than high school	**55.2** ± 8.3	**56.4** ± 8.1	**49.8** ± 9.6	**-5.4** ± 7.4	**-6.6** ± 7.5
High school graduate/GED	**48.9** ± 4.8	**51.3** ± 4.4	**53.5** ± 4.6	**4.6** ± 4.2*	**2.2** ± 3.8
Some college or technical school	**49.1** ± 5.3	**54.4** ± 4.8	**57.7** ± 4.0	**8.6** ± 3.8*	**3.3** ± 3.3*
College graduate or beyond	**71.0** ± 5.7	**72.1** ± 4.2	**79.7** ± 3.7	**8.7** ± 4.0*	**7.6** ± 3.0*

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Never Smokers. Increases over time in the percentages of Minnesotans who have never smoked are inherently desirable because smoking-related morbidity and mortality in the population as a whole, along with associated social and economic impacts, decrease as the percentage of never smokers increases. Minnesota's programmatic efforts that affect the prevalence of never smoking include maintaining adult never smokers as never smokers and encouraging young people not to start smoking.

The percentage of never smokers increased from 1999 to 2007 (Table 2-8). Between 1999 and 2007, there was a 5.8±2.6 point increase in the percentage of Minnesotans who are never smokers, from 52.1±2.1 percent to 57.9±1.6 percent. The increase since 2003 was 2.5±2.4 points. Both increases are statistically significant.

Table 2-8. Never smokers among all Minnesota adults from 1999 to 2007, by selected demographic characteristics

Characteristics	1999	2003	2007	Change over time	
				1999 to 2007	2003 to 2007
	%	%	%	%	%
Overall	**52.1** ± 2.1	**55.4** ± 1.8	**57.9** ± 1.6	**5.8** ± 2.6 *	**2.5** ± 2.4 *
Age					
18 to 24	**55.0** ± 7.0	**62.1** ± 4.3	**73.0** ± 4.7	**18.0** ± 8.4 *	**10.9** ± 6.4 *
25 to 44	**56.7** ± 3.1	**61.6** ± 3.2	**62.6** ± 3.0	**5.9** ± 4.3 *	**1.0** ± 4.4
45 to 64	**43.1** ± 3.6	**47.2** ± 3.2	**50.6** ± 2.3	**7.5** ± 4.3 *	**3.4** ± 4.0
65 or older	**54.5** ± 5.0	**51.0** ± 3.4	**50.0** ± 2.4	**-4.5** ± 5.5	**-1.0** ± 4.1
Gender					
Female	**57.0** ± 2.7	**60.7** ± 2.4	**61.0** ± 2.0	**4.0** ± 3.4 *	**0.2** ± 3.1
Male	**47.0** ± 3.2	**49.8** ± 2.8	**54.7** ± 2.5	**7.7** ± 4.0 *	**4.9** ± 3.7 *
Education					
Less than high school	**46.5** ± 6.8	**53.3** ± 7.2	**47.6** ± 6.4	**1.1** ± 9.3	**-5.7** ± 9.6
High school graduate/GED	**45.2** ± 3.8	**46.4** ± 3.5	**47.8** ± 3.3	**2.7** ± 5.0	**1.5** ± 4.7
Some college or technical school	**51.3** ± 3.8	**55.0** ± 3.5	**58.2** ± 2.8	**6.9** ± 4.7 *	**3.1** ± 4.4
College graduate or beyond	**64.1** ± 3.7	**66.4** ± 2.6	**70.9** ± 2.1	**6.8** ± 4.3 *	**4.5** ± 3.3 *

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Most encouraging is the very large increase in the never smoking rate of 18-24-year-olds. From 1999 to 2007, the rate increased by 18.0±8.4 points, to 73.0±4.7 percent. From 2003 to 2007, the increase was 10.9±6.4 points. Both of these increases are statistically significant. This increase should be considered in light of the tobacco industry's increased targeting of young adults and social trends that delay the uptake of smoking into young adulthood. The tobacco control community will need to focus its efforts to preserve these gains as the current young adult cohort ages. A more detailed discussion of young adult prevalence rates in Minnesota is included in chapter 5. Among the other age groups, statistically significant increases occurred between 1999 and 2007: 5.9±4.3 points for 25-44-year-olds and 7.5±4.3 points for 45-64-year-olds.

Both men and women show statistically significant increases in their never smoking rates from 1999 to 2007, a 7.7±4.0 point increase for men and 4.0±3.4 point increase for women. The increase of 4.9±3.7 points from 2003 to 2007 for men is also significant.

Mirroring the decline in smoking prevalence, the higher educational groups show statistically significant increases in the never smoking rate from 1999 to 2007, nearly 7 points both for those with some college (6.9±4.7) and for college graduates (6.8±4.3). The increase of 4.5±3.3 points from 2003 to 2007 for college graduates is likewise significant.

Use of Non-Cigarette Tobacco Products: Pipes, Cigars and Smokeless Tobacco, 1999 to 2007

Use of Non-Cigarette Tobacco Products among all Minnesotans. Between 1999 and 2007, Minnesotans showed a small but statistically significant reduction in the overall use of any non-cigarette tobacco products (Table 2-9). Minnesotans' use of at least one type of non-cigarette tobacco product declined by 1.8±1.4 points in this period. Use of cigars declined 1.7±1.1 points, a statistically significant change. None of the changes in usage of other non-cigarette tobacco products between 2003 and 2007 are significant.

Table 2-9. Tobacco use among Minnesota adults and current smokers from 1999 to 2007, by tobacco product

Current toacco use	1999	2003	2007	Change over time	
				1999 to 2007	2003 to 2007
	%	%	%	%	%
Minnesota adults					
Any tobacco products	**27.0** ± 1.9	**22.9** ± 1.6	**21.1** ± 1.5	**-5.8** ± 2.4 *	**-1.8** ± 2.2
Any non-cigarette tobacco	**7.9** ± 1.2	**5.9** ± 0.9	**6.1** ± 0.8	**-1.8** ± 1.4 *	**0.2** ± 1.2
Pipe	**0.9** ± 0.4	**0.5** ± 0.2	**0.5** ± 0.3	**-0.5** ± 0.5	**0.0** ± 0.4
Cigar	**4.5** ± 1.0	**2.5** ± 0.6	**2.8** ± 0.6	**-1.7** ± 1.1 *	**0.3** ± 0.8
Smokeless tobacco	**3.4** ± 0.7	**3.2** ± 0.7	**3.1** ± 0.6	**-0.3** ± 0.9	**0.0** ± 0.9
Current smokers					
Any non-cigarette tobacco	**14.9** ± 3.2	**10.7** ± 2.8	**11.9** ± 2.8	**-3.1** ± 4.3	**1.2** ± 4.0
Pipe	**2.0** ± 1.2	**1.1** ± 0.7	**0.9** ± 0.6	**-1.1** ± 1.3	**-0.2** ± 0.9
Cigar	**10.9** ± 3.0	**5.4** ± 2.2	**7.5** ± 2.4	**-3.4** ± 3.8	**2.1** ± 3.2
Smokeless tobacco	**5.2** ± 2.0	**5.0** ± 2.0	**4.4** ± 1.6	**-0.8** ± 2.6	**-0.5** ± 2.5

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

There were statistically significant increases in the percentages of Minnesotans who had never used pipes or cigars (not shown in table). Between 1999 and 2007, never users of pipes increased by 4.9±1.6 percent, from 86.8±1.4 percent to 91.7±0.75 percent; never users of cigars increased by 4.0±2.2 points, from 78.9±1.8 percent to

82.9±1.3 percent. MATS will continue to monitor the use of alternative tobacco products.

Use of Pipes, Cigars and Smokeless Tobacco among Current Cigarette Smokers. For ease of comparison, the statistics for the changes in cigarette smokers' use of non-cigarette tobacco products appear in Table 2-9 immediately below the results for all Minnesotans. There were no statistically significant changes in the use of the various non-cigarette forms of tobacco by cigarette smokers between 1999 and 2007 or between 2003 and 2007. Smokers do not appear to be switching to smokeless tobacco in response to increased limitations on smoking in public spaces.

Use of Tobacco Products (All Forms). Between 1999 and 2007, there was a statistically significant decline of 5.8±2.4 percentage points in the percent of Minnesotans who were current users of some form of tobacco, including cigarettes, pipes, cigars, smokeless or other forms. As previously reported, there was a corresponding decline of 5.1±2.2 points in cigarette smoking over this period.

2.3 Characteristics of Smokers

Current tobacco control science suggests that multiple factors influence smoking behavior. At the individual level, demographic characteristics; knowledge, attitudes and beliefs; and the tobacco use characteristics of current smokers influence the initiation and continuation of smoking. At the social level, many smokers' *perceptions* of their environment and the availability of tobacco products also influence their behavior.

The previous demographic discussions have described the characteristics of *all* Minnesotans, in terms of their smoking status. This section focuses on the characteristics of *smokers* in terms of their individual behavioral and attitudinal factors, as well as their perceptions of their social circumstances. Some of the behavioral factors may be termed the "clinical" characteristics of smokers, which are a hybrid of smoking-related behaviors and health status indicators. Other environmental factors, such as smokers' experiences in health care and workplace settings, as well as social and structural influences, will be covered in later chapters.

This section offers a snapshot of selected characteristics of Minnesota adult smokers and some comparisons to former smokers and never smokers. The term "nonsmokers" refers to former and never smokers combined. This section first describes the characteristics of smokers in 2007, and then explores changes in the characteristics of smokers from 1999 to 2007.

2.3.1 Individual Demographic Characteristics of Smokers

Minnesota smokers tend to have lower educational levels and lower household incomes than former smokers or never smokers (Table 2-10). About 10 percent (9.9±2.1 percent) of smokers have a college degree, compared with 26.3±2.2 percent of former smokers and 35.0±1.8 percent of never smokers. At the other extreme, 12.8±3.9 percent of smokers have not completed high school, compared with 8.6±1.6 percent of former smokers and only 6.8±1.1 percent of never smokers. Current smokers are more likely to be high school graduates and less likely to be college graduates than either former smokers or never smokers; these differences are statistically significant.

Minnesota smokers tend to have lower household incomes than former smokers or never smokers. Among current smokers, 23.3±3.9 percent have household incomes above $75,000, while 34.3±2.7 percent of former smokers and 41.5±2.2 percent of never smokers have incomes in this range. At the low end, 34.6±4.3 percent of smokers have household incomes of $35,000 or less, compared with 24.8±2.3 percent of former smokers and 23.3±1.9 percent of never smokers.

2.3.2 Individual Health and Behavioral Characteristics of Smokers

Overall health status, and health-related behaviors characterize smokers. General health status includes physical and mental health status. Use of alcohol likewise provides some insight into the overall behavioral health profile of smokers.

Table 2-10. Selected demographic characteristics, by smoking status

Characteristics	Current smoker	Former smoker	Never smoker
	%	%	%
Education			
Less than high school	**12.8** ± 3.9	**8.6** ± 1.6	**6.8** ± 1.1
High school graduate/GED	**42.4** ± 4.7	**33.0** ± 2.7	**24.6** ± 1.9
Some college or technical school	**34.8** ± 4.1	**32.1** ± 2.5	**33.6** ± 2.1
College graduate or beyond	**9.9** ± 2.1	**26.3** ± 2.2	**35.0** ± 1.8
Total	**100**	**100**	**100**
Household income			
$35,000 or less	**34.6** ± 4.3	**24.8** ± 2.3	**23.3** ± 1.9
$35,001 to $50,000	**19.6** ± 4.2	**18.6** ± 2.4	**14.0** ± 1.6
$50,001 to $75,000	**22.4** ± 3.9	**22.3** ± 2.6	**21.1** ± 1.8
$75,001 or more	**23.3** ± 3.9	**34.3** ± 2.7	**41.5** ± 2.2
Total	**100**	**100**	**100**
Marital status			
Married	**46.5** ± 4.6	**71.1** ± 2.4	**65.6** ± 2.0
A member of an unmarried couple	**12.0** ± 3.4	**4.3** ± 0.9	**3.2** ± 0.8
Divorced	**10.8** ± 2.0	**8.2** ± 1.4	**4.2** ± 0.8
Widowed	**3.3** ± 1.0	**7.7** ± 0.9	**4.6** ± 0.5
Separated	**1.9** ± 1.1	**0.5** ± 0.4	**0.6** ± 0.3
Never married	**25.5** ± 4.2	**8.2** ± 2.0	**21.8** ± 1.9
Total	**100**	**100**	**100**

Source: Minnesota Adult Tobacco Survey, 2007

The age of first trying smoking and regular smoking is linked to the smoker's level of addiction. Taking up smoking at an early age is associated with reduced quitting success, and it also equates to more cumulative exposure to the harmful components of cigarette smoke. MATS assessed two of the principal measures of the degree of addiction that may hinder smokers' chances of quitting: the number of cigarettes smoked per day, and the amount of time between waking and smoking the first cigarette.

Tracking these measures at the population level over time monitors trends in smoking behaviors to help assess Minnesota's comprehensive tobacco control program and plan future efforts.

Health Status of Smokers

Compared with nonsmokers, smokers are at higher risk for the most common diseases that shorten life and reduce its quality, including cancer, pulmonary disorders, heart disease and diabetes. Even in a surveillance survey such as MATS, which cannot obtain specific clinical diagnoses, it is possible to measure the association between smoking behavior and health status using various broad, indirect measures.

Health Status Indicators

MATS used several simple, standard measures of physical and mental health status that are well documented as correlating with clinically determined health status.

Survey Questions

- In general, would you say your health is excellent, very good, good, fair or poor?
- During the past 30 days, how many days did you have any problems as a result of your physical health, illness or injury?
- During the past 30 days, how many days did you have any problems as a result of your mental health or emotional problems, such as feeling depressed or anxious?
- During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as taking care of yourself, work or recreation?

On average, smokers are in poorer health than others (Table 2-11). Only 12.9±2.6 percent of smokers regard themselves as in excellent health, compared with 21.6±2.3 percent of former smokers and 29.0±1.9 percent of never smokers. The difference between smokers and each of the other two groups is statistically significant. There is also a clear pattern in the number of days that current, former and never smokers experienced physical or mental health-related problems in the past 30 days. While 7.2±2.5 percent of current smokers experienced 30 days of physical problems, only 3.6±0.7 percent of never smokers had 30 such days. At the other end of the distribution, 68.8±4.6 percent of current smokers had no days of physical health problems in the past 30 days, compared with 71.6±2.5 percent of former smokers and 78.1±1.7 percent of never smokers. Similarly, 3.2±1.4 percent of current smokers

Table 2-11. Selected health status indicators, by smoking status

Health status indicators	Current smoker	Former smoker	Never smoker
	%	%	%
Health rating			
Excellent	**12.9** ± 2.6	**21.6** ± 2.3	**29.0** ± 1.9
Very good	**39.7** ± 4.5	**39.8** ± 2.7	**43.3** ± 2.1
Good	**30.7** ± 4.3	**25.9** ± 2.3	**21.7** ± 1.7
Fair	**13.2** ± 3.9	**9.2** ± 1.5	**5.2** ± 0.9
Poor	**3.4** ± 1.3	**3.5** ± 1.4	**0.8** ± 0.2
Total	**100**	**100**	**100**
Number of days with physical health problems			
None	**68.8** ± 4.6	**71.6** ± 2.5	**78.1** ± 1.7
1 to 2 days	**7.5** ± 1.8	**8.1** ± 1.4	**8.2** ± 1.1
3 to 9 days	**10.0** ± 3.2	**7.9** ± 1.6	**6.3** ± 0.9
10 to 29 days	**6.5** ± 3.3	**4.7** ± 1.5	**3.8** ± 0.9
30 days	**7.2** ± 2.5	**7.7** ± 1.2	**3.6** ± 0.7
Total	**100**	**100**	**100**
Number of days with mental health problems			
None	**75.0** ± 3.9	**86.4** ± 1.8	**88.1** ± 1.3
1 to 2 days	**6.4** ± 2.0	**4.5** ± 1.1	**5.8** ± 1.1
3 to 9 days	**7.2** ± 2.2	**4.7** ± 1.1	**3.2** ± 0.6
10 to 29 days	**8.2** ± 2.8	**2.9** ± 1.0	**2.1** ± 0.5
30 days	**3.2** ± 1.2	**1.5** ± 0.5	**0.8** ± 0.4
Total	**100**	**100**	**100**
Number of days activities affected by health problems			
None	**80.2** ± 4.0	**87.1** ± 1.8	**89.4** ± 1.3
1 to 2 days	**5.1** ± 1.6	**4.8** ± 1.3	**4.4** ± 1.0
3 to 9 days	**6.8** ± 3.6	**3.5** ± 1.1	**3.4** ± 0.7
10 to 29 days	**4.7** ± 1.6	**2.0** ± 0.6	**1.3** ± 0.3
30 days	**3.2** ± 1.4	**2.6** ± 0.7	**1.5** ± 0.6
Total	**100**	**100**	**100**

Source: Minnesota Adult Tobacco Survey, 2007

had 30 days when they experienced mental or emotional problems, whereas only 0.8±0.4 percent of never smokers did. In terms of days when physical or mental problems limited their activities, 3.2±1.2 percent of current smokers had 30 limited days, but only 1.5±0.6 percent of never smokers did. On all three of these measures of health-affected days, the percentages of former smokers fall between those of current and never smokers.

Analysis by the mean number of days with health-related problems replicates the above pattern (not shown in table). In the past 30 days, smokers on average had 3.7±0.8 days with physical problems, while never smokers had 2.1±0.2 days.

Smokers averaged 2.6±0.5 days with mental health problems, compared with 0.8±0.2 days for never smokers. Compared with never smokers, smokers experienced nearly two more days on which their activities were affected by health problems: 4.9±1.1 days out of the past 30 for smokers and 3.0±0.6 for never smokers. Again, former smokers fall between the current and never smokers in the mean number of health-affected days.

Comparative Drinking Behavior of Smokers

A well-established behavioral relationship exists between smoking and drinking, particularly problem drinking.[16]

Drinking Indicators

MATS 2007 used several common measures of alcohol use, including daily frequency of alcohol use in past 30 days, quantity of drinks in past 30 days, heavy drinking and binge drinking.

- A **heavy drinker** has averaged more than two drinks per day over the past 30 days (men) / more than one drink per day over the past 30 days (women). The definition of heavy drinking conforms to that used by CDC's Behavioral Risk Factor Surveillance Survey.
- A **binge drinker** had one or more episodes of having five or more drinks on a single occasion in the past 30 days (men and women).

Survey Questions

- During the past 30 days, have you had at least one drink of any alcoholic beverage such as beer, wine, wine coolers or liquor?
- During the past 30 days, how many days did you drink any alcoholic beverages?
- A drink is one can or bottle of beer, one glass of wine, one can or bottle of wine cooler, one cocktail or one shot of liquor. During the past 30 days, on the days when you drank, about how many drinks did you drink on an average day?
- Considering all types of alcoholic beverages, how many times during the past 30 days did you have five or more drinks on a single occasion?

In terms of any use of alcohol, there is little difference among current, former and never smokers, with 64.2±4.7 percent of current smokers and 57.2±2.1 percent of never smokers having had a drink in the past 30 days (Table 2-12). However, smokers drank more often and in greater quantities than never smokers, averaging 4.7 days on which they drank and 26.3 drinks over the past 30 days, compared with 3.5 days and 13.5 drinks for never smokers. Former smokers partially deviate from the typical pattern of fitting between current and never smokers for the number of days on which they drank (5.9 days); but they maintain the pattern for the number of drinks (19.5). (These data are not shown in Table 2-12.)

Table 2-12. Selected drinking behaviors, by smoking status

Drinking behaviors	Current smoker	Former smoker	Never smoker
	%	%	%
Drank alcohol in past 30 days			
Yes	**64.2** ± 4.7	**63.9** ± 2.7	**57.2** ± 2.1
No	**35.8** ± 4.7	**36.1** ± 2.7	**42.8** ± 2.1
Total	**100**	**100**	**100**
Heavy drinker			
Yes	**12.3** ± 3.0	**6.7** ± 2.1	**3.4** ± 1.0
No	**87.7** ± 3.0	**93.3** ± 2.1	**96.6** ± 1.0
Total	**100**	**100**	**100**
Binge drinker			
Yes	**32.4** ± 4.4	**14.6** ± 2.2	**10.9** ± 1.2
No	**67.6** ± 4.4	**85.4** ± 2.2	**89.1** ± 1.2
Total	**100**	**100**	**100**

Source: Minnesota Adult Tobacco Survey, 2007

The expected pattern is well defined for two measures of problem drinking: heavy drinking and binge drinking (Table 2-12). Among current smokers, 12.3±3.0 percent were heavy drinkers during the past 30 days, compared with only 3.4±1.0 percent of never smokers. Current smokers engaged in binge drinking at three times the rate of never smokers in the past 30 days, 32.4±4.4 percent compared with 10.9±1.2 percent. The differences between smokers and never smokers were statistically significant for both measures. As seen in Table 2-12, former smokers are more like never smokers than current smokers in regard to these two measures.

Smoking Onset: Ages of Initiation and Regular Smoking

The age when an individual first tries a cigarette and the age when he or she becomes a regular smoker are important to understanding how people take up smoking and become addicted to nicotine. The ages at which these events occur relate to a smoker's level of addiction, the potential for successfully quitting smoking, and the risk for tobacco-related disease: the earlier the uptake, the longer the time of exposure and the greater the cumulative exposure to cigarette toxins. From an epidemiological and public health perspective, tracking the change in these two measures over time provides the tobacco control community with information necessary to target prevention programs and identify factors that may affect the age of smoking uptake in the population at large.

Age of Initiation and Age of Regular Smoking

Age of smoking initiation has a clear-cut definition that is easily communicated to survey respondents: the age when they first tried a cigarette. Not only is this a simple concept, it represents a salient event that individuals are likely to recall even after many years.

In contrast, the transition between the stage of "trying cigarettes" and the stage of "being a smoker" is more difficult to identify. The average smoker can more easily report when he or she became a "regular smoker" than when he or she smoked the 100th cigarette. The concept of regular smoker used in this section is subjective and differs from the objective definition of "smoker" used elsewhere in this report (having smoked 100 or more cigarettes in one's lifetime) but provides a plausible approximation of the age of transition.

Survey Questions

- How old were you the first time you smoked a cigarette, even one or two puffs?
- How old were you when you first started smoking cigarettes regularly?

Age of Initiation

80 percent (80.1±3.3 percent) of current smokers tried their first cigarette before age 18. Overall, 11.1±2.7 percent of current smokers tried their first cigarette by the time they were 11 years old, and 36.2±4.7 percent by the age of 14 (Table 2-13). Only 6.7±2.1 percent first tried smoking after reaching the age of 21.

Table 2-13. Age of smoking initiation among current smokers, by selected demographic characteristics

Characteristics	Age of initiation					
	11 years old and younger	12-14 years old	15-17 years old	18-20 years old	21 years and older	Row total
	%	%	%	%	%	%
Overall	**11.1** ± 2.7	**36.2** ± 4.7	**32.8** ± 4.3	**13.2** ± 2.7	**6.7** ± 2.1	**100**
Age						
18 to 24	**11.5** ± 9.0	**42.6** ± 11.4	**31.6** ± 10.4	**14.1** ± 8.5	**0.2** ± 0.3	**100**
25 to 44	**12.3** ± 4.3	**41.3** ± 8.4	**29.9** ± 7.0	**11.1** ± 4.0	**5.3** ± 3.8	**100**
45 to 64	**10.5** ± 3.9	**30.9** ± 5.6	**35.1** ± 6.8	**14.2** ± 4.1	**9.4** ± 3.3	**100**
65 or older	**4.3** ± 4.3	**11.7** ± 6.2	**44.1** ± 11.9	**21.5** ± 7.8	**18.4** ± 8.2	**100**
Gender						
Female	**8.1** ± 2.8	**38.4** ± 7.0	**33.0** ± 6.4	**13.6** ± 3.8	**6.9** ± 2.2	**100**
Male	**13.7** ± 4.4	**34.4** ± 6.3	**32.5** ± 5.9	**12.9** ± 3.7	**6.5** ± 3.4	**100**
Education						
Less than high school	**21.1** ± 12.6	**45.5** ± 17.6	**23.6** ± 10.6	**6.6** ± 4.9	**3.2** ± 3.1	**100**
High school graduate/GED	**9.9** ± 4.0	**37.3** ± 7.4	**36.8** ± 7.7	**12.1** ± 4.4	**3.8** ± 1.8	**100**
Some college or technical school	**10.0** ± 3.5	**35.3** ± 6.5	**30.4** ± 5.9	**14.9** ± 4.6	**9.4** ± 4.8	**100**
College graduate or beyond	**7.8** ± 5.2	**20.9** ± 8.4	**35.9** ± 10.8	**21.1** ± 6.9	**14.4** ± 8.2	**100**
Household income						
$35,000 or less	**12.5** ± 4.5	**34.8** ± 7.3	**35.0** ± 7.3	**11.8** ± 3.6	**5.9** ± 2.5	**100**
$35,001 to $50,000	**8.4** ± 5.5	**46.3** ± 12.9	**24.9** ± 8.4	**13.4** ± 6.0	**7.0** ± 8.0	**100**
$50,001 to $75,000	**11.1** ± 5.4	**42.2** ± 10.5	**26.3** ± 7.4	**14.4** ± 6.0	**5.9** ± 3.0	**100**
$75,001 or more	**8.6** ± 5.0	**30.7** ± 8.5	**37.9** ± 9.5	**15.0** ± 7.1	**7.7** ± 4.9	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Compared with the oldest cohort, younger cohorts of current smokers initiated smoking at younger ages. The only distinct and statistically significant difference in age of initiation occurs between smokers who are under 65 years old and those who are 65 or older. Approximately 16 percent of these oldest smokers had begun smoking by age 14, compared with the approximately 42 percent to 54 percent of the other age groups who did so (Figure 2-6). Conversely, 18.4±8.2 percent of the oldest group did not try a cigarette until the age of 21, and only 5 percent to 9 percent of the other age groups show this later initiation. This last statement ignores the rate of later initiation for current 18-24-year-olds, which approaches zero; the 18-20-year-olds in this group who have not yet tried a cigarette may still do so before they reach their 21 birthday. While generally indicative of historical trends,

the differences in age of smoking initiation among the various age groups may not support fine distinctions, especially since recall of the precise age when they smoked their first cigarette may diminish as time passes.

Figure 2-6. Age of smoking initiation for current smokers, by current age group

Current age group	11 years old and younger	12-14 years old	15-17 years old	18-20 years old	21 years and older
18 to 24	11.5	42.6	31.6	14.1	0.2
25 to 44	12.3	41.3	29.9	11.1	5.3
45 to 64	10.5	30.9	35.1	14.2	9.4
65 or older	4.3	11.7	44.1	21.5	18.4

Source: Minnesota Adult Tobacco Survey, 2007

Higher educational levels appear associated with later ages of smoking initiation, as shown in Table 2-13. The relationships, however, are not statistically significant. Still, the possibility that those who do not eventually complete high school tend to initiate earlier is sufficiently interesting to note here as a possible subject for future research. These differences in achieved educational levels were attained mostly in the future rather than at the time of the first cigarette. This suggests that socioeconomic, familial, psychological or behavioral factors that prevailed in adolescence may be associated with both early smoking uptake and lower

educational expectations. (As will be discussed, this same pattern persists into the onset of regular smoking.)

There are no significant differences in age of initiation for gender or income.**

Age of Regular Smoking

Nearly half (49.4 percent) of current smokers became regular smokers before age 18 (Table 2-14). Overall, 12.4±3.4 percent of current smokers became regular smokers between the ages of 12 and 14, and 17.6±3.0 percent became regular smokers after reaching the age of 21. Less than 2 percent (1.8±0.7 percent) have never smoked regularly.

Table 2-14. Age of becoming a regular smoker among current smokers, by selected demographic characteristics

Characteristics	Age of regular smoking						
	11 years old and younger	12-14 years old	15-17 years old	18-20 years old	21 years and older	Never smoked regularly	Row total
	%	%	%	%	%	%	%
Overall	1.6 ± 1.0	12.4 ± 3.4	35.4 ± 4.8	31.2 ± 4.0	17.6 ± 3.0	1.8 ± 0.7	100
Age							
18 to 24	0.8 ± 1.7	14.6 ± 9.6	40.0 ± 11.0	42.1 ± 11.6	0.5 ± 0.5	1.9 ± 2.1	100
25 to 44	2.2 ± 2.0	12.7 ± 6.0	39.6 ± 8.3	27.1 ± 6.3	16.2 ± 5.2	2.2 ± 1.3	100
45 to 64	1.4 ± 1.4	12.3 ± 4.2	29.6 ± 6.9	31.5 ± 5.7	24.2 ± 5.0	0.8 ± 0.5	100
65 or older	0.0 ± 0.0	5.1 ± 4.8	24.6 ± 11.8	32.8 ± 10.1	33.1 ± 10.9	4.3 ± 4.6	100
Gender							
Female	0.5 ± 0.4	14.3 ± 4.4	34.4 ± 7.2	32.2 ± 6.1	16.8 ± 3.5	1.8 ± 1.0	100
Male	2.5 ± 1.9	10.9 ± 5.1	36.2 ± 6.4	30.4 ± 5.2	18.2 ± 4.7	1.8 ± 1.0	100
Education							
Less than high school	3.7 ± 4.8	19.9 ± 11.6	48.5 ± 17.2	16.7 ± 8.6	11.1 ± 7.4	0.2 ± 0.3	100
High school graduate/GED	1.9 ± 1.8	14.2 ± 6.4	40.1 ± 7.8	31.1 ± 6.5	11.1 ± 3.3	1.6 ± 1.2	100
Some college or technical school	1.0 ± 1.0	9.9 ± 3.8	29.2 ± 6.0	34.9 ± 6.4	23.5 ± 6.0	1.7 ± 1.2	100
College graduate or beyond	0.0 ± 0.0	1.7 ± 1.7	21.7 ± 8.5	39.2 ± 10.6	32.7 ± 9.7	4.7 ± 3.1	100
Household Income							
$35,000 or less	1.4 ± 1.6	16.5 ± 5.6	32.8 ± 7.7	31.0 ± 6.5	17.4 ± 4.6	0.9 ± 1.1	100
$35,001 to $50,000	0.0 ± 0.0	10.2 ± 5.1	39.9 ± 13.4	33.0 ± 10.1	16.2 ± 8.9	0.7 ± 0.7	100
$50,001 to $75,000	3.8 ± 3.5	10.2 ± 10.5	37.4 ± 9.5	28.4 ± 7.9	17.6 ± 6.3	2.6 ± 1.9	100
$75,001 or more	0.0 ± 0.0	6.8 ± 4.3	36.7 ± 9.7	34.3 ± 9.0	19.5 ± 6.8	2.7 ± 1.8	100

Source: Minnesota Adult Tobacco Survey, 2007

Generally, individuals spend a few years advancing from trying their first cigarette to regular use. While the age at which individuals became regular smokers shows the various demographic patterns similar to those present when they first tried a cigarette, these patterns manifest themselves later for the age of becoming a regular

** As with educational level, current income level at the time of MATS 2007 was for nearly all of the population a future attainment at the time when they tried their first cigarette.

smoker. Comparing Table 2-13 to Table 2-14, the distributions across the various demographic subgroups shift to the right by one age group.

Lower educational attainment is associated with younger age of regular smoking. The percentage of those who became regular smokers at earlier ages is higher for the less educated and decreases as educational level rises.

There are no statistically significant differences in age of becoming a regular smoker for age, gender or income.

Smoking Intensity

Smoking intensity, the number of cigarettes that people smoke, measures smokers' direct exposure to cigarette toxins and their approximate level of addiction to cigarettes. Knowing the number of cigarettes that people smoke also provides population-based data about cigarette consumption patterns, which are useful in assessing the effect of tobacco control programs.

Over half (54.1±4.7 percent) of Minnesota smokers are light smokers, while 10.3±2.8 percent are heavy smokers (Table 2-15). While young adults have the highest smoking prevalence of all age groups, they smoke less intensely than any other group, with 70.4±10.6 percent of 18-24-year-olds being light smokers. The 45-64-year-olds tend to smoke the most, with only 45.0±6.5 percent being light smokers, and 16.7±5.9 percent heavy smokers. The differences between these two age groups in the percentages of light and heavy smokers are the only statistically significant ones for age. There are no significant differences for smoking intensity for education, gender or income.

Cigarettes per Day and Smoking Intensity

When using self-reported smoking data, calculating the number of cigarettes that a person smokes per day examines smoking behavior in the 30 days immediately preceding the date the person completed the survey. The typical approach is to ask the respondent to estimate the average number of cigarettes smoked each day. If the person smoked every day, then it is simply necessary to ask how many cigarettes he or she smoked on average. However, if the person smoked only some days, it is unfeasible to ask for an average number smoked, considering all 30 days in the period. The standard way of handling these two scenarios is to ask the questions differently.

Survey Questions

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

  For everyday smokers, ask:

  On average, about how may cigarettes per day do you smoke?

  For some day smokers, ask:

  During the past 30 days, on how many days did you smoke cigarettes?

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

Cigarettes per Day

The average across all 30 days is calculated as: the number of days smoked multiplied by the number of cigarettes smoked on days smoked divided by 30. This measure captures smoking intensity as a standardized daily exposure to inhaled cigarette smoke.

Smoking Intensity

MATS classifies the number of cigarettes smoked per day into a common three-category approach: light (fewer than 15 cigarettes per day), moderate (15 to 24) or heavy (25 or more). These terms are used in the tobacco research literature in the relative sense; smoking fewer than 15 cigarettes per day still has serious health effects.

Table 2-15. Smoking intensity (averaged across past 30 days) and time to first cigarette after waking, for current smokers

Characteristics	Smoking intensity				Time to first cigarette		
	Light	Moderate	Heavy	Row total	30 minutes or less	More than 30 minutes	Row total
	%	%	%	%	%	%	%
Overall	**54.1** ± 4.7	**35.6** ± 4.6	**10.3** ± 2.8	**100**	**46.2** ± 4.7	**53.8** ± 4.7	**100**
Age							
18 to 24	**70.4** ± 10.6	**25.0** ± 10.2	**4.6** ± 4.3	**100**	**36.8** ± 11.7	**63.2** ± 11.7	**100**
25 to 44	**55.2** ± 8.2	**38.3** ± 8.3	**6.5** ± 3.4	**100**	**43.4** ± 8.2	**56.6** ± 8.2	**100**
45 to 64	**45.0** ± 6.5	**38.3** ± 6.2	**16.7** ± 5.9	**100**	**54.3** ± 6.4	**45.7** ± 6.4	**100**
65 or older	**59.2** ± 11.3	**25.6** ± 9.1	**15.3** ± 8.9	**100**	**43.3** ± 11.2	**56.7** ± 11.2	**100**
Gender							
Female	**59.7** ± 7.1	**32.4** ± 6.9	**7.9** ± 4.4	**100**	**45.8** ± 6.9	**54.3** ± 6.9	**100**
Male	**49.3** ± 6.4	**38.4** ± 6.3	**12.3** ± 3.5	**100**	**46.6** ± 6.4	**53.4** ± 6.4	**100**
Education							
Less than high school	**42.4** ± 15.8	**42.5** ± 18.1	**15.1** ± 8.6	**100**	**69.3** ± 12.9	**30.7** ± 12.9	**100**
High school graduate/GED	**50.0** ± 7.7	**38.2** ± 7.4	**11.8** ± 5.5	**100**	**49.3** ± 7.6	**50.8** ± 7.6	**100**
Some college or technical school	**58.4** ± 6.5	**33.2** ± 6.2	**8.4** ± 3.1	**100**	**39.1** ± 6.3	**60.9** ± 6.3	**100**
College graduate or beyond	**69.3** ± 8.8	**26.1** ± 8.4	**4.6** ± 2.6	**100**	**27.1** ± 7.7	**72.9** ± 7.7	**100**
Household income							
$35,000 or less	**58.0** ± 7.5	**30.4** ± 6.7	**11.6** ± 6.3	**100**	**49.3** ± 7.4	**50.7** ± 7.4	**100**
$35,001 to $50,000	**45.3** ± 12.0	**46.0** ± 12.8	**8.7** ± 4.7	**100**	**53.9** ± 12.0	**46.1** ± 12.0	**100**
$50,001 to $75,000	**46.7** ± 10.1	**40.3** ± 9.5	**13.0** ± 5.2	**100**	**49.7** ± 9.9	**50.3** ± 9.9	**100**
$75,001 or more	**57.0** ± 9.6	**33.2** ± 9.2	**9.9** ± 5.8	**100**	**33.4** ± 9.0	**66.6** ± 9.0	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Time to First Cigarette after Waking

MATS also determines the typical length of time between waking and smoking the first cigarette, a strong indicator of nicotine addiction.

Level of Addiction

Among various measures, smoking within 30 minutes of waking is indicative of strong addiction.

Survey Question

- How soon after you wake up do you smoke your first cigarette? Would you say within 5 minutes, 6-30 minutes, 31-60 minutes or after 60 minutes?

Nearly half (46.2±4.7 percent) of Minnesota smokers smoke their first cigarette of the day within 30 minutes of waking (Table 2-15). As age increases, this addiction measure increases in a statistically significant way. Similar to smoking prevalence, smokers with the highest educational and income levels are least likely to light up within 30 minutes of waking, at 27.1±7.7 percent and 33.4±9.0 percent, respectively.

Education shows a statistically significant pattern in relation to this indicator: immediate smoking after waking declines as education rises.

Looking at the combination of smoking intensity and time to first cigarette, there are two subgroups that show the highest percentages on *both* addiction measures: by age, the 45-64-year-olds, and by education, those with less than a high school degree have the highest percentages on both measures.

2.3.3 Individual-level Influences on Smoking Behavior: Perceptions of Harm

Smokers tend to differ from nonsmokers in their knowledge and attitudes related to tobacco use.[17] Among the range of these potential individual-level influences, MATS focuses on the perceived harmfulness of various forms of tobacco use. These results help tailor programs to reach smokers. Tracking these measures across time also helps assess the effectiveness of tobacco control messages.

Perceptions of harm are important indicators of potential experimentation with tobacco use, motivation to quit and support for tobacco control policies. This section looks at the perceived harmfulness of using cigarettes and other tobacco products. It first examines the perceived harmfulness of occasional cigarette smoking, and then examines the perceived harmfulness of using other tobacco products *relative* to smoking cigarettes. For both forms of perceived harmfulness, the chapter examines differences in perception by smoking status and demographic groups.

Assuming that most people would agree that heavy smoking is harmful, MATS does not ask about this issue. However, people, especially smokers, may not view occasional cigarette smoking as harmful. MATS tracks the perceived harmfulness of occasional smoking because it indicates the extent to which Minnesotans understand the dangers of smoking.

Harm of Occasional Cigarette Use

Survey Question

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

Nearly 80 percent (78.3±1.5 percent) of Minnesotans agree that smoking an occasional cigarette is harmful (Table 2-16). The perceived harmfulness of occasional smoking is higher among never smokers (84.0±1.8 percent) than among former smokers (77.0±2.5 percent), and higher among former smokers than current smokers (61.1±4.5 percent). This statistically significant relationship suggests that smokers hold beliefs that may either have led to their smoking initiation or reinforce their current behavior.

Perceptions of the harm in occasional smoking differ by gender, education and income in statistically significant ways. Women (81.1±1.9 percent) are more likely than men (75.4±2.2 percent) to think occasional smoking is harmful. Those with higher levels of education (84.3±1.9 percent of those with a college degree) are more likely than those with lower levels of education (68.9±6.7 percent of those without a high school diploma) to think occasional smoking is harmful. Similarly, people in the highest income category (80.9±2.4 percent) are more likely than those in the lowest income category (72.2±3.2 percent) to think occasional smoking is harmful.

Table 2-16. Perceived harmfulness of smoking an occasional cigarette, by selected demographic characteristics and smoking status

Characteristics	Perceived harmful %
Overall	**78.3** ± 1.5
Age	
18 to 24	**71.8** ± 4.8
25 to 44	**79.9** ± 2.9
45 to 64	**78.8** ± 2.0
65 or older	**78.2** ± 2.1
Gender	
Female	**81.1** ± 1.9
Male	**75.4** ± 2.2
Education	
Less than high school	**68.9** ± 6.7
High school graduate/GED	**74.7** ± 3.0
Some college or technical school	**78.8** ± 2.5
College graduate or beyond	**84.3** ± 1.9
Household Income	
$35,000 or less	**72.2** ± 3.2
$35,001 to $50,000	**75.9** ± 4.5
$50,001 to $75,000	**80.4** ± 3.0
$75,001 or more	**80.9** ± 2.4
Smoking status	
Current smokers	**61.1** ± 4.5
Former smokers	**77.0** ± 2.5
Never smokers	**84.0** ± 1.8

Source: Minnesota Adult Tobacco Survey, 2007

Tobacco control efforts have generally focused on cigarette smoking. In response, the tobacco industry has begun marketing non-cigarette and alternative cigarette products as "safer" alternatives to cigarettes, in spite of the fact that no form of tobacco use has been proven safe. The scientific community generally agrees that light or ultra-light cigarettes, "natural" cigarettes and roll-your-own cigarettes are as harmful as regular cigarettes.[18] Although both hookah[19] and smokeless tobacco[20] have been shown to be harmful, there is not consensus on the level of harm. Because Minnesotans who would never smoke cigarettes might be willing to try other forms of tobacco products, or current users of these other forms of tobacco might be less interested in quitting, MATS monitors perceptions of the relative harm of using these tobacco products compared with smoking regular cigarettes.

Perceptions of Tobacco Products

Survey Question

- In your opinion, are any of the following products less harmful, more harmful or just as harmful as smoking cigarettes?

  Smoking tobacco in a hookah pipe?

  Smokeless tobacco such as snuff and chewing tobacco?

  Light or ultra-light cigarettes?

  "Natural" cigarettes like Native Spirit cigarettes?

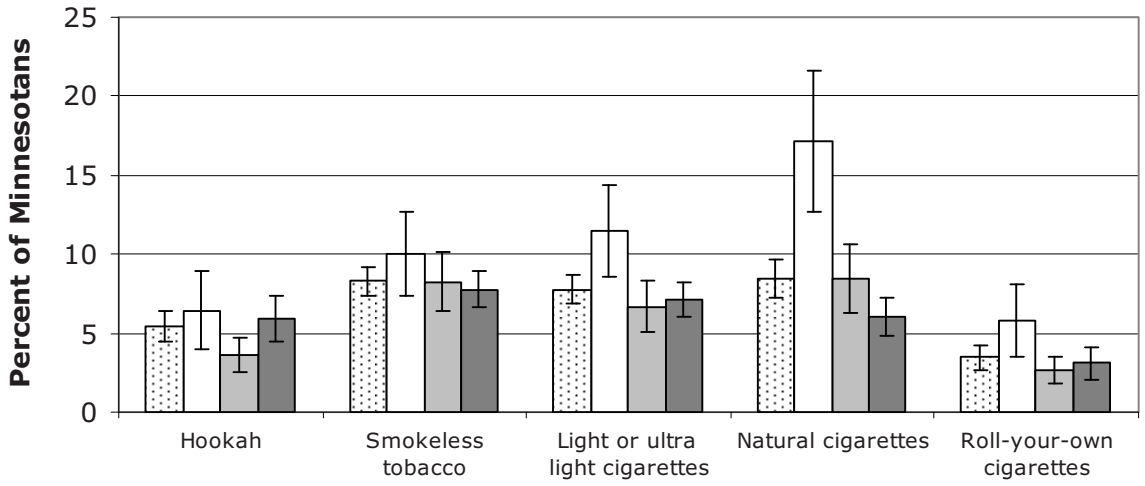
  Roll-your-own cigarettes?

Only between 5 percent and 9 percent of Minnesotans perceive other tobacco products as less harmful than cigarettes, depending on the tobacco product in question (Figure 2-7).

For only one of the alternative types of cigarettes, "natural" cigarettes, are there statistically significant differences by smoking status. Current smokers (17.1±4.5 percent) are more likely than former smokers (8.5±2.2 percent) or never smokers (6.0±1.3 percent) to think "natural" cigarettes are less harmful than cigarettes (Figure 2-7). These findings may imply that current smokers are either less informed or more receptive to false claims that these products are safer than regular cigarettes.

For hookah and "natural" cigarettes, there are also statistically significant differences by age. Young adults (11.3±3.7 percent) are more likely than all the other age groups to perceive smoking tobacco in a hookah as less harmful than smoking cigarettes (Table 2-17). In addition, young adults (15.2±4.1 percent) are more likely than all other age groups to think "natural" cigarettes are less harmful than other cigarettes. These differences may reflect a marketing focus on youth from the tobacco industry.

Figure 2-7. Perception of other tobacco products as less harmful than cigarettes, by smoking status



Smoking status	Hookah	Smokeless tobacco	Light or ultra light cigarettes	Natural cigarettes	Roll-your-own cigarettes
Overall	5.4 ± 1.0	8.3 ± 0.9	7.7 ± 0.9	8.5 ± 1.2	3.5 ± 0.8
Current smoker	6.5 ± 2.5	10.0 ± 2.6	11.5 ± 2.9	17.1 ± 4.5	5.8 ± 2.4
Former smoker	3.6 ± 1.1	8.3 ± 1.9	6.7 ± 1.6	8.5 ± 2.2	2.7 ± 0.8
Never smoker	5.9 ± 1.4	7.8 ± 1.1	7.1 ± 1.1	6.0 ± 1.3	3.1 ± 1.1

Source: Minnesota Adult Tobacco Survey, 2007

Table 2-17. Perception of other tobacco products as less harmful than cigarettes, by selected demographic characteristics and smoking status

Characteristics	Hookah: less harmful	Smokeless tobacco: less harmful	Light/ultra-light cigarettes: less harmful	All natural cigarettes: less harmful	Roll-your-own cigarettes: less harmful
	%	%	%	%	%
Overall	**5.4** ± 1.0	**8.3** ± 0.9	**7.7** ± 0.9	**8.5** ± 1.2	**3.5** ± 0.8
Age					
18 to 24	**11.3** ± 3.7	**9.1** ± 3.1	**11.7** ± 3.8	**15.2** ± 4.1	**5.1** ± 2.3
25 to 44	**4.8** ± 1.8	**8.7** ± 1.8	**7.2** ± 1.6	**9.1** ± 2.2	**4.3** ± 1.7
45 to 64	**3.8** ± 1.0	**7.7** ± 1.2	**7.8** ± 1.3	**6.1** ± 1.3	**1.8** ± 0.5
65 or older	**5.1** ± 1.4	**7.8** ± 1.4	**5.8** ± 1.2	**4.9** ± 1.6	**3.6** ± 0.9
Gender					
Female	**3.9** ± 1.0	**5.2** ± 1.0	**6.6** ± 1.1	**6.9** ± 1.3	**2.1** ± 0.6
Male	**7.0** ± 1.7	**11.5** ± 1.5	**8.9** ± 1.4	**10.1** ± 2.0	**4.8** ± 1.4
Education					
Less than high school	**6.8** ± 2.9	**10.8** ± 3.4	**7.8** ± 3.0	**9.8** ± 4.7	**4.4** ± 2.1
High school graduate/GED	**4.7** ± 2.2	**8.2** ± 2.1	**6.5** ± 1.5	**9.5** ± 2.6	**4.9** ± 2.0
Some college or technical school	**5.3** ± 1.7	**8.0** ± 1.4	**8.3** ± 1.8	**8.8** ± 2.1	**3.2** ± 1.2
College graduate or beyond	**6.0** ± 1.4	**8.1** ± 1.4	**8.4** ± 1.5	**6.7** ± 1.6	**2.1** ± 0.7
Household income					
$35,000 or less	**6.0** ± 2.2	**8.5** ± 1.8	**8.3** ± 1.9	**11.3** ± 3.0	**4.2** ± 1.3
$35,001 to $50,000	**4.3** ± 1.7	**8.4** ± 2.5	**8.8** ± 3.1	**11.9** ± 3.9	**4.2** ± 2.3
$50,001 to $75,000	**4.6** ± 1.5	**7.9** ± 2.3	**6.6** ± 1.6	**7.1** ± 2.8	**2.8** ± 1.2
$75,001 or more	**5.9** ± 2.0	**8.8** ± 1.5	**8.4** ± 1.6	**6.5** ± 1.4	**3.3** ± 1.6
Smoking status					
Current smokers	**6.5** ± 2.5	**10.0** ± 2.6	**11.5** ± 2.9	**17.1** ± 4.5	**5.8** ± 2.4
Former smokers	**3.6** ± 1.1	**8.3** ± 1.9	**6.7** ± 1.6	**8.5** ± 2.2	**2.7** ± 0.8
Never smokers	**5.9** ± 1.4	**7.8** ± 1.1	**7.1** ± 1.1	**6.0** ± 1.3	**3.1** ± 1.1

Source: Minnesota Adult Tobacco Survey, 2007

2.3.4 Social Environment of Smoking

The social environment—consisting of one's family, friends and coworkers, and incorporating perceptions of one's community—is a major influence on individual behavior. Social environments can support smoking behaviors in a number of ways, including increasing opportunities to smoke, increasing the number of friends and family members who model smoking behavior as positive, encouraging the misperception that smoking is the social norm, and increasing the availability of cigarettes. To describe the social environment of smoking, MATS measures both the social context that surrounds smokers, which is often different from the social context of former or never smokers, and the social interactions that accompany the act of smoking itself. Again, this cross-sectional analysis cannot assert a causal relationship between these measures and smoking. Still, the results inform effective interventions and track the effectiveness over time of such interventions in the social environment.

Social Context of Smoking

MATS measures the social context of smokers by asking about living with other smokers and having close friends or family members who smoke. It measures the social interactions that accompany smoking activity by asking about whether people smoke mainly when drinking, whether they smoke mainly with others, and whether they give cigarettes to or receive cigarettes from other smokers.

Living with a Smoker. Living with a smoker lends social support for one's own smoking behaviors by supporting the idea that smoking is normal and by creating a context where smoking is acceptable. Living with a smoker is a predictor of one's own smoking status, motivation for quitting and potential success in quitting.

Living with a Smoker

Survey Question

- Not including yourself, how many of the adults who live in your household smoke cigarettes, cigars or pipes?

Nearly 20 percent (17.5±1.5 percent) of Minnesotans live with a smoker (Table 2-18). Current smokers (46.7±4.7 percent) are far more likely to live with a smoker than never smokers (10.7±1.5 percent) or former smokers (13.2±2.2 percent). This statistically significant relationship demonstrates the likely role of the home environment in supporting smoking behavior.

Young adults (28.6±4.8 percent) are also more likely to live with a smoker than 25-44-year-olds (18.2±2.8 percent), 45-64-year-olds (17.0±2.1 percent) and those 65 or older (7.9±1.5 percent). All of these differences are statistically significant.

Table 2-18. Smoking environment, by selected demographic characteristics and smoking status

Characteristics	Live with smoker(s)	Someone close uses tobacco
	%	%
Overall	**17.5** ± 1.5	**58.1** ± 1.5
Age		
18 to 24	**28.6** ± 4.8	**66.7** ± 4.9
25 to 44	**18.2** ± 2.8	**61.2** ± 2.8
45 to 64	**17.0** ± 2.1	**57.1** ± 2.3
65 or older	**7.9** ± 1.5	**45.2** ± 2.4
Gender		
Female	**17.9** ± 2.0	**60.5** ± 1.9
Male	**17.0** ± 2.2	**55.5** ± 2.4
Education		
Less than high school	**24.1** ± 7.1	**61.5** ± 5.7
High school graduate/GED	**23.1** ± 3.2	**66.6** ± 2.7
Some college or technical school	**18.1** ± 2.3	**59.9** ± 2.8
College graduate or beyond	**8.9** ± 1.6	**46.3** ± 2.3
Household income		
$35,000 or less	**18.4** ± 3.1	**61.0** ± 3.2
$35,001 to $50,000	**21.0** ± 4.5	**63.0** ± 4.0
$50,001 to $75,000	**20.8** ± 3.3	**62.6** ± 3.3
$75,001 or more	**14.2** ± 2.3	**54.1** ± 2.7
Smoking status		
Current smokers	**46.7** ± 4.7	**82.0** ± 2.9
Former smokers	**13.2** ± 2.2	**59.1** ± 2.6
Never smokers	**10.7** ± 1.5	**50.5** ± 2.1

Source: Minnesota Adult Tobacco Survey, 2007

Friends and Family Who Smoke. Having close friends or family members who smoke also lends social support for smoking.

Family and Friends Who Smoke

Survey Question

- My next question is about people close to you, for example, your parents, spouse, children or close friends and relatives. Does someone close to you smoke or use other forms of tobacco?

Nearly 60 percent (58.1±1.5 percent) of Minnesotans have someone close to them who uses tobacco (Table 2-18). Current smokers (82.0±2.9 percent) are much more likely to have someone close to them who uses tobacco than former smokers

(59.1±2.6) or never smokers (50.5±2.1). This statistically significant difference again demonstrates the likely effect of social support in initiating or maintaining smoking behavior.

Younger age, lower education and lower income also correlate in a statistically significant way with an increased likelihood of being close to someone who uses tobacco. Young adults (66.7±4.9 percent of 18-24-year-olds) are more likely to have someone close to them who uses tobacco than 45-64-year-olds (57.1±2.3 percent) and 65 or older (45.2±2.4 percent). People who have not completed high school (61.5±5.7 percent) or who are high school graduates (66.6±2.7 percent) are more likely to have someone close to them who uses tobacco than people who have graduated from college (46.3±2.3 percent). Finally, people who earn $35,000 or less per year (61.0±3.2 percent) are more likely to have someone close to them who uses tobacco than those who earn more than $75,000 or more per year (54.1±2.7 percent).

Social Situations that Accompany Smoking

Social situations that involve smoking create social support for smoking. These interactions may affect a smoker's motivation to quit, self-efficacy for quitting and other factors related to quitting discussed in chapter 3. This section examines three social interactions that involve smoking: the belief that smoking provides a social benefit; the behavior of smoking mainly with other people or mainly when drinking alcohol; and exchanging cigarettes with other smokers.

Beliefs about Smoking Making People Comfortable. The belief that smoking makes people feel more comfortable in social situations has been found to be commonly held in national surveys.[21]

Beliefs about Smoking Making People Comfortable

Survey Question

- Please tell me whether you agree or disagree with the following statement. "Smoking helps people feel more comfortable at parties and other social situations."

Over half (53.7±1.7 percent) of Minnesotans believe that smoking makes people feel more comfortable in social situations (Table 2-19). There are statistically significant differences in this belief by smoking status, age and gender. Former smokers (60.9±2.7 percent) are most likely to think that smoking makes people feel comfortable, followed by current smokers (52.2±4.8 percent) and never smokers (50.9±2.2 percent). Young adults (43.5±5.3 percent) are less likely to think smoking makes people feel comfortable than 25-44-year-olds (52.1±3.1 percent), 45-64-year-olds (59.1±2.4 percent) and those 65 or older (54.1±2.5 percent). Men (56.4±2.6 percent) are significantly more likely than women (50.9±2.1 percent) to think that smoking makes people feel comfortable.

Table 2-19. Belief that smoking makes people more comfortable in social situations, by selected demographic characteristics and smoking status

Characteristics	Agree %
Overall	**53.7** ± 1.7
Age	
18 to 24	**43.5** ± 5.3
25 to 44	**52.1** ± 3.1
45 to 64	**59.1** ± 2.4
65 or older	**54.1** ± 2.5
Gender	
Female	**50.9** ± 2.1
Male	**56.4** ± 2.6
Education	
Less than high school	**53.0** ± 6.6
High school graduate/GED	**54.6** ± 3.4
Some college or technical school	**53.5** ± 3.0
College graduate or beyond	**53.3** ± 2.4
Household Income	
$35,000 or less	**53.1** ± 3.4
$35,001 to $50,000	**59.1** ± 4.3
$50,001 to $75,000	**55.5** ± 3.8
$75,001 or more	**51.3** ± 2.8
Smoking status	
Current smokers	**52.2** ± 4.8
Former smokers	**60.9** ± 2.7
Never smokers	**50.9** ± 2.2

Source: Minnesota Adult Tobacco Survey, 2007

Smoking Mainly with Other People and Smoking Mainly When Drinking. The term "social smokers" refers to people who tend to smoke mainly as part of a social activity. Understanding social smoking behaviors is important because social smokers may not respond to traditional cessation treatment messages in the same way as other smokers. Further, social smoking may be a key step in smoking initiation among young adults, a topic explored in more detail in chapter 5.

Social Smoking Behaviors

Survey Questions

- In the past 30 days, did you smoke mainly when you were with people, mainly when you were alone, or did you smoke as often when you were by yourself as with others?
- In the past 30 days, would you say you were more likely to smoke while you were drinking, more likely to smoke while you were not drinking, or you were just as likely to smoke while you were drinking as while you were not drinking?

Nearly 20 percent (18.9±3.4 percent) of smokers smoke mainly when they are with other people (Table 2-20). One third (33.3±5.0 percent) of smokers are more likely to smoke while drinking alcohol. The majority of smokers are not influenced by social factors such as companionship or drinking when engaging in smoking. Drinking appears to be a larger situational factor than companionship.

These factors, however, appear more influential among younger smokers. Both smoking mainly with other people and smoking when drinking are associated with age. Young adults (26.9±9.4 percent) are more likely to smoke mainly with other people than are 45-64-year-olds (14.3±3.0 percent) and those 65 or older (7.0±4.3 percent). Similarly, 52.3±13.5 percent of young adult smokers are more likely to smoke while drinking, which is a statistically significant difference from 45-64-year-olds (23.3±6.2 percent) and those 65 or older (11.8±8.1 percent).

Table 2-20. Influence of company and drinking† on smoking among current smokers, by selected demographic characteristics

Characteristics	Smoke mainly when with people	Smoke mainly when alone	Smoke as often alone as with others	Row total	More likely to smoke while drinking	More likely to smoke while not drinking	Just as likely to smoke while drinking as when not	Row total
	%	%	%	%	%	%	%	%
Overall	18.9 ± 3.4	19.2 ± 3.0	61.9 ± 4.2	100	33.3 ± 5.0	8.0 ± 2.2	58.7 ± 5.2	100
Age								
18 to 24	26.9 ± 9.4	4.9 ± 4.5	68.2 ± 9.9	100	52.3 ± 13.5	1.6 ± 1.0	46.1 ± 13.6	100
25 to 44	21.3 ± 6.1	15.5 ± 4.6	63.2 ± 7.3	100	34.4 ± 8.0	7.0 ± 3.3	58.7 ± 8.3	100
45 to 64	14.3 ± 4.0	26.7 ± 5.3	59.1 ± 6.2	100	23.3 ± 6.2	11.9 ± 4.4	64.8 ± 7.1	100
65 or older	7.0 ± 4.3	41.7 ± 10.8	51.3 ± 11.5	100	11.8 ± 8.1	19.9 ± 15.0	68.3 ± 16.2	100
Gender								
Female	21.1 ± 4.8	19.8 ± 4.2	59.1 ± 6.2	100	30.7 ± 7.1	8.5 ± 3.1	60.8 ± 7.2	100
Male	17.0 ± 4.7	18.7 ± 4.2	64.3 ± 5.8	100	35.3 ± 6.9	7.7 ± 3.1	57.0 ± 7.3	100
Education								
Less than high school	13.6 ± 8.7	14.0 ± 7.7	72.4 ± 12.1	100	36.6 ± 17.5	14.4 ± 10.9	49.0 ± 18.7	100
High school graduate/GED	16.2 ± 4.9	18.6 ± 4.9	65.3 ± 6.6	100	30.7 ± 7.8	7.6 ± 3.5	61.8 ± 8.4	100
Some college or technical school	23.9 ± 6.2	20.1 ± 4.8	56.0 ± 6.7	100	32.2 ± 7.8	7.3 ± 3.3	60.5 ± 8.0	100
College graduate or beyond	20.1 ± 7.4	25.1 ± 8.5	54.8 ± 10.4	100	42.2 ± 13.2	7.2 ± 4.3	50.6 ± 12.7	100
Household income								
$35,000 or less	20.9 ± 5.6	24.9 ± 5.7	54.1 ± 7.2	100	33.4 ± 8.4	13.4 ± 5.7	53.2 ± 8.9	100
$35,001 to $50,000	20.2 ± 9.4	17.7 ± 7.1	62.1 ± 11.2	100	32.7 ± 10.7	5.9 ± 5.1	61.5 ± 11.3	100
$50,001 to $75,000	13.3 ± 5.6	19.9 ± 7.0	66.8 ± 8.6	100	33.2 ± 9.7	6.8 ± 3.7	60.0 ± 9.9	100
$75,001 or more	21.4 ± 8.0	14.6 ± 5.3	64.0 ± 8.9	100	34.9 ± 10.7	5.9 ± 3.4	59.3 ± 10.9	100

† For current smokers who had at least one drink in the past 30 days

Source: Minnesota Adult Tobacco Survey, 2007

Exchanging Cigarettes with Other Smokers. Giving cigarettes to or receiving cigarettes from other smokers provides access to cigarettes and also provides normative support for smoking behavior.

Exchanging Cigarettes

Survey Questions

- Which of the following best describes how you usually get most of the cigarettes that you smoke?... I buy them myself or I get them from another smoker.
- Have you given away a cigarette to a friend or acquaintance in the past 30 days?

Only a small percentage, 6.0±1.8 percent, of current smokers usually gets most of their cigarettes from other smokers (Table 2-21). At the same time, 72.1±4.0 percent of current smokers have given away a cigarette in the past 30 days, suggesting that there is some social exchange of cigarettes among smokers, but social exchange supplies the bulk of cigarettes consumed for only a small number of people.

Table 2-21. Obtaining and giving away cigarettes among current smokers, by selected demographic characteristics

Characteristics	Obtaining cigarettes			Gave away cigarettes to others (past 30 days)
	Buy most myself	Get most from another smoker	Row total	
	%	%	%	%
Overall	**94.0** ± 1.8	**6.0** ± 1.8	**100**	**72.1** ± 4.0
Age				
18 to 24	**87.1** ± 7.3	**12.9** ± 7.3	**100**	**94.6** ± 3.1
25 to 44	**94.6** ± 2.5	**5.4** ± 2.5	**100**	**76.1** ± 7.4
45 to 64	**95.9** ± 2.3	**4.1** ± 2.3	**100**	**63.1** ± 5.8
65 or older	**95.2** ± 4.6	**4.8** ± 4.6	**100**	**33.0** ± 9.6
Gender				
Female	**95.0** ± 2.2	**5.0** ± 2.2	**100**	**65.1** ± 6.6
Male	**93.1** ± 2.8	**6.9** ± 2.8	**100**	**78.1** ± 4.5
Education				
Less than high school	**91.3** ± 7.6	**8.8** ± 7.6	**100**	**64.0** ± 18.6
High school graduate/GED	**96.7** ± 1.8	**3.3** ± 1.8	**100**	**74.7** ± 5.7
Some college or technical school	**92.4** ± 3.7	**7.6** ± 3.7	**100**	**74.2** ± 5.0
College graduate or beyond	**91.0** ± 4.0	**9.0** ± 4.0	**100**	**66.9** ± 9.2
Household income				
$35,000 or less	**94.4** ± 2.7	**5.6** ± 2.7	**100**	**70.7** ± 5.8
$35,001 to $50,000	**95.9** ± 3.5	**4.1** ± 3.5	**100**	**70.7** ± 14.1
$50,001 to $75,000	**91.9** ± 5.3	**8.1** ± 5.3	**100**	**72.7** ± 7.9
$75,001 or more	**91.8** ± 4.6	**8.2** ± 4.6	**100**	**73.3** ± 7.5

Source: Minnesota Adult Tobacco Survey, 2007

2.3.5 Characteristics of Smokers, 1999 to 2007

This section examines Minnesota smokers in terms of the changes over time in selected smoking-related behaviors and attitudes.

Smoking Intensity

From 1999 to 2007, there was approximately a 4 percent shift in the percentage of heavy smokers to moderate and light smokers (Table 2-22). All of this 4 percent change is found between 2003 and 2007, with more pronounced movement out of both heavy and moderate smoking to light smoking. These estimates have relatively wide confidence intervals and are not significant.

Table 2-22. Smoking intensity and time to first cigarette after waking, among smokers from 1999 to 2007

Smoking characteristics	1999	2003	2007	Change over time	
				1999 to 2007	2003 to 2007
	%	%	%	%	%
Smoking intensity					
Light	**53.8** ± 4.4	**49.8** ± 4.5	**54.1** ± 4.7	**0.4** ± 6.4	**4.4** ± 6.5
Moderate	**32.1** ± 3.9	**38.1** ± 4.4	**35.6** ± 4.6	**3.5** ± 6.1	**-2.4** ± 6.4
Heavy	**14.1** ± 3.1	**12.2** ± 3.1	**10.3** ± 2.8	**-3.9** ± 4.1	**-1.9** ± 4.2
Time to first cigarette after waking					
30 minutes or less	**46.8** ± 4.4	**47.5** ± 4.5	**46.2** ± 4.7	**-0.6** ± 6.4	**-1.3** ± 6.5
More than 30 minutes	**53.2** ± 4.4	**52.5** ± 4.5	**53.8** ± 4.7	**0.6** ± 6.4	**1.3** ± 6.5

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Time to First Cigarette after Waking

As mentioned earlier, time to first cigarette after waking is a robust indicator of level of nicotine dependence. There are no statistically significant changes between 1999 and 2007, or between 2003 and 2007, in the percentage of smokers who smoke their first cigarette within 30 minutes of waking (Table 2-22). This suggests that there have been no changes in the overall level of nicotine dependence among smokers in Minnesota during these time periods.

Perceptions of Harm

As discussed in section 2.3.3, perception of harm is an important indicator of potential experimentation with tobacco use, motivation to quit and support for tobacco control policies. This section examines trends in the perceived harmfulness of smoking an occasional cigarette. There was an increase of about 6 percentage points in the percent of Minnesotans who regard smoking an occasional cigarette as harmful. In 2003, 72.5±4.4 percent of Minnesotans thought smoking an occasional cigarette was harmful. In 2007, this number increased to 78.3±1.5 percent. This increase of 5.8±4.7 percentage points is statistically significant.

MATS also examined the trends from 1999 to 2007 and 2003 to 2007 in living with a smoker, the perception that smoking makes people feel more comfortable at social events, and obtaining cigarettes from other smokers. There were no significant

changes in these items in either time period, and the non-significant changes were very small (between 1 and 2 percentage points).

2.4 Key Findings

Some of the most important findings from this chapter are summarized below. All differences presented in this summary are statistically significant at the 0.05 confidence level unless otherwise noted.

Key Prevalence Findings for 2007

- About 634,000 adult Minnesotans, or 17.0±1.4 percent, are current smokers. Younger people, men, those with lower educational levels and those with lower household income levels are more likely to be smokers.
- About 936,000 adult Minnesotans, or 25.1±1.3 percent, are former smokers, and the quit ratio among those who have ever smoked is 59.6±2.6 percent.
- About 2.2 million adult Minnesotans, or 57.9±1.6 percent, have not smoked 100 cigarettes in their lifetime and are considered never smokers. Younger people, women, those with higher educational levels, and those with higher household income levels are more likely to be never smokers.
- Slightly more than 6 percent (6.1±0.8 percent) of Minnesotans are current users of one or more non-cigarette tobacco products (not including hookah).
- Almost 12 percent (11.9±2.8 percent) of cigarette smokers also use some other form of tobacco.
- Over 20 percent (21.1±1.5 percent) of Minnesotans use some form of tobacco, including cigarettes, pipes, cigars, smokeless or other forms. The general patterns by age, gender, education and income are the same for overall tobacco use as for cigarette smoking.
- Compared with smokers, never smokers are twice as likely to rate their health as excellent (29.0±1.9 percent versus 12.9±2.6 percent).
- Compared with never smokers, smokers experienced nearly two more days a month on which their activities were affected by health problems.

- Compared with never smokers, smokers were three to four times more likely to evidence problem drinking behaviors.
- Nearly half (46.2±4.7 percent) of Minnesota smokers smoke their first cigarette of the day within 30 minutes of waking.
- Lower educational levels are associated with signs of greater addiction to cigarettes, as measured by smoking intensity and time to first cigarette.
- Nearly 80 percent (78.3±1.5 percent) of Minnesotans think that smoking an occasional cigarette is harmful. Current smokers are considerably less likely to think so.
- Only between 5 percent and 9 percent of Minnesotans (depending on the product in question) perceive selected tobacco products as less harmful than cigarettes. Younger adults show a slightly greater likelihood to perceive light and "natural" cigarettes as less harmful.
- About one in six Minnesotans lives with a smoker, but nearly half of smokers do. About 60 percent of Minnesotans are close to someone who smokes, ranging from half of never smokers to four of five current smokers.
- Nearly 20 percent (18.9±3.4 percent) of smokers smoke mainly when they are with other people. One third (33.3±5.0 percent) of smokers are more likely to smoke while drinking alcohol.

Key Prevalence Findings for 1999 to 2007

- Between 1999 and 2007, the percentage of adults in Minnesota who are current smokers declined from 22.1±1.7 percent to 17.0±1.4 percent. This decline of 5.1±2.2 percentage points is statistically significant. Young adults aged 18-24 showed a large decline of 12.7±7.8 percentage points.
- Between 1999 and 2007, the percentage of never smokers increased by 5.8±2.6 percentage points, from 52.1±2.1 percent to 57.9±1.6 percent. Young adults showed a large increase of 18.0±8.4 percentage points.

- Between 1999 and 2007, the percentage of former smokers remained steady, at about 25 percent of the population. However, the quit ratio among those who have ever smoked increased by 5.7±2.2 percentage points, from 53.9±2.9 percent to 59.6±2.6 percent.
- Between 1999 and 2007, there was a decline of 5.8±2.4 percentage points in the percent of Minnesotans who are current users of some form of tobacco, including cigarettes, pipes, cigars, smokeless or other forms.
- There were no statistically significant changes between 1999 and 2007, or between 2003 and 2007, in the percentage of Minnesotans who are light smokers. This percentage remained between 50 percent and 55 percent in 1999 (53.8±4.4 percent), 2003 (49.8±4.5 percent) and 2007 (54.1±4.7 percent).
- In 2003, 72.5±4.4 percent of Minnesotans thought smoking an occasional cigarette was harmful. In 2007, this number increased by 5.8±4.7 percentage points to 78.3±1.5 percent.

2.5 Discussion

Significant gains have been made in reducing the prevalence of tobacco use in Minnesota. As a result, there are 164,000 fewer smokers in Minnesota in 2007 compared with 1999 when the first MATS was conducted. While MATS is the most comprehensive source of information on tobacco use in Minnesota, there are two other surveillance efforts that also produce state-level prevalence rates for Minnesota adults: the Behavioral Risk Factor Surveillance System and the Tobacco Use Supplement of the Current Population Survey (CPS). Historically, BRFSS and CPS prevalence rates are similar to or slightly higher than MATS prevalence rates but the overall trend is the same.

Furthermore, the prevalence of smoking among adult Minnesotans appears to be declining at a rate faster than the national average and continues to decline at a time when the national rate has leveled off. These trends suggest that comprehensive tobacco control efforts in Minnesota are working to reduce the harm that tobacco causes.

The decline in smoking can be attributed, in part, to quitting by smokers. By quitting, tobacco users have an opportunity to experience both immediate and long-term health benefits. In time, these health benefits will result in decreased tobacco-related disease and death, and reduced health care costs. Some of the decline in prevalence can also be attributed to fewer Minnesotans starting to smoke. The significant increases in the percentage of Minnesotans who report never smoking means that many more Minnesotans will be protected against the harm of tobacco use. This increase in never smokers is particularly prominent in young adults.

Minnesota's success in reducing the burden of tobacco addiction, however, is uneven. Those with lower socioeconomic status as measured by education and income still smoke at markedly higher rates than others. Efforts to reach lower socioeconomic status smokers are warranted. In addition, efforts to address the harms of tobacco in other racial and ethnic communities that are disproportionally marketed to by the tobacco industry are also needed.

Supporting smokers in their attempts to quit will be challenging. While most smokers know that tobacco use is harmful, many smokers live with other smokers or have relatives or friends who smoke, which can make quitting and staying quit even harder. Nearly half of Minnesota smokers continue to smoke their first cigarette within 30 minutes of waking, which demonstrates the highly addictive nature of tobacco. Tobacco control efforts must continue to create environments that support quitting so that all who desire to quit can do so successfully.

The tobacco industry is well aware of the efforts to reduce tobacco use and continues to strategically promote its products. The tobacco industry spent approximately $238 million in marketing its products to Minnesotans in 2005 alone. The industry has increased its marketing expenditures by 103 percent since its settlement with the state in 1998.[22] This amount far overshadows the funding available to tobacco control partners.

The tobacco industry also develops and promotes new products that are marketed as safer or less harmful. Current MATS data show low usage rates for products other than cigarettes, but surveillance of the use of other new tobacco products should be continued. It is especially important to continue assessing the use of all forms of tobacco since MATS data show that smokers may be more open to messages that claim light or "natural" cigarettes are less harmful.

The following chapters provide greater detail about how Minnesotans are quitting, their level of exposure to secondhand smoke, and the unique challenges of young adults' attitudes, beliefs and behaviors regarding smoking and quitting. These data, along with information about Minnesota's tobacco-related programs that target the individual, social and structural levels, provide a detailed picture of ongoing efforts designed to continue these important declines in tobacco use.

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3. Quitting Behaviors of Minnesota Adults

3.1 Introduction

Quitting smoking reduces the risk of premature death and disease, and while all smokers benefit from quitting, the earlier they quit, the more likely they are to realize substantial health benefits.[1] Quitting is difficult, however, because the nicotine in cigarettes is highly addictive. Withdrawal symptoms such as irritability, anxiety, difficulty concentrating or increased appetite demonstrate the highly addictive nature of cigarettes.[2] Seventy percent of smokers in the United States want to quit; however, national data show that, each year, only 4.7 percent of smokers quit and maintain that quit for three months to a year.[3]

Smoking has long been common in social environments such as bars, restaurants and other entertainment venues, which can make quitting and staying quit more difficult.[4] Further, the tobacco industry promotes its products heavily.[5] Discounts, sponsorships and advertising support the use of tobacco and make it visible and attractive.

3.1.1 Helping Smokers Quit: A Goal of Comprehensive Tobacco Control

Encouraging smoking cessation, or quitting, is part of a comprehensive tobacco control program.[6] The most recent *Best Practices for Comprehensive Tobacco Control* guide from the CDC highlights the importance of cessation interventions to increase availability of behavioral support and medications to treat tobacco use.[7] Building on the social ecological framework for behavior change, the CDC recommends interventions that support quitting at individual, social and structural levels.

At the individual level, effective treatments for nicotine addiction include providing Food and Drug Administration (FDA)-approved stop-smoking medications and behavioral counseling. Counseling may occur in a face-to-face setting or from a stop-smoking telephone quitline or website, to which physicians and other health care providers can easily refer their patients who smoke.

Targeting the social environment through health communication interventions, which include media campaigns, both promotes stop-smoking programs and changes public perception of tobacco use. Interventions in the clinical and health system can encourage health care providers to identify smokers and refer them to stop-smoking programs. Interventions in the workplace environment can support quitting by encouraging employees to participate in stop-smoking programs and by requiring smoke-free indoor and outdoor environments.

At the structural level, policy approaches aim to discourage smoking by increasing the cost of cigarettes. Another effective policy-level strategy to support quitting is prohibiting smoking in all worksites, including bars and restaurants. In addition to the primary goal of protecting nonsmokers from secondhand smoke, such policies can also shift the social norms by making public tobacco use less common and, therefore, less acceptable.

3.1.2 Smoking Cessation in Minnesota: A Collaborative Effort

Since 1998, when the state of Minnesota and Blue Cross reached a settlement with the tobacco industry, ClearWay Minnesota, Blue Cross and MDH have led a comprehensive program that targets multiple levels of intervention to provide quitting assistance and shape environments to support Minnesota smokers in their quit attempts. Other health plans, voluntary agencies and funded community organizations have contributed greatly to these efforts.

This chapter describes MATS 2007 results related to quitting and compares those results with results of previous years. Specifically, it examines the prevalence of attempts to quit smoking among Minnesota smokers, their use of quit support aids, and their environments, which may or may not support quitting.

Section 3.2 focuses on quitting behavior and use of quit aids. Section 3.3 describes Minnesotans' experience with the quitting assistance their health care providers offer. Section 3.4 describes the association between policy environments and quitting smoking, particularly the presence of smoking restrictions in the home, workplace or community, and the cost of cigarettes. Each section first describes the environment that existed in 2007 and then, when data are available, compares it to the conditions in 1999 and 2003.

3.2 Quitting Smoking and Use of Assistance to Quit

3.2.1 Past-year Smoking, Quitting and Successful Quitting

Past-year Smoking, Quitting and Successful Quitting

Past-year smokers include individuals who have smoked at any time during the past year, that is, all current smokers as of the date of interview, and former smokers *if* they last smoked regularly any time in the 12 months immediately preceding the interview. To examine the prevalence of past-year quitting, MATS considers quit attempts and quits among this denominator population of past-year smokers.

Past-year quitters include both current smokers who made a quit attempt in the past 12 months and all former smokers who last smoked regularly within the past 12 months. Thus, the measure of past-year quitters includes those with both unsuccessful and successful quit attempts.

Past-year successful quitters include all those past-year smokers who are former smokers at the time of their interview, that is, those who were smoking at some point in the past 12 months but are no longer smoking.

Survey Questions

- During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?
- How many times in the past 12 months did you try to quit smoking?
- About how long has it been since you last smoked cigarettes regularly?

Note: Given the focus on the past 12 months in this analysis, caution must be used in interpreting the prevalence of past-year successful quitters. Some current smokers may have been quit for many of the past 12 months and recently relapsed. Conversely, some former smokers may have been smoking for much of the past 12 months and only recently quit. The finding does not describe sustained abstinence.

Quitting Among Past-year Smokers

Past-year Smokers**.** In the 12 months preceding MATS 2007, 19.1±1.4 percent of Minnesotans smoked cigarettes (Table 3-1); these past-year smokers combine current smokers and former smokers who last smoked regularly less than a year ago, and total about 703,000 people.

Table 3-1. Past-year smoking and quitting, by selected demographic characteristics

Characteristics	Past year smokers (among all Minnesotans)	Past year quitters (attempters among past-year smokers)	Successful past-year quitters (among past-year smokers)
	%	%	%
Overall	**19.1** ± 1.4	**56.7** ± 4.3	**9.8** ± 2.1
Age			
18 to 24	**23.5** ± 4.5	**64.4** ± 10.0	**8.4** ± 4.8
25 to 44	**21.7** ± 2.8	**53.9** ± 7.7	**8.6** ± 3.4
45 to 64	**20.0** ± 2.1	**57.4** ± 6.1	**10.9** ± 3.3
65 or older	**7.3** ± 1.4	**54.2** ± 10.7	**16.4** ± 7.3
Gender			
Female	**17.4** ± 1.9	**64.3** ± 5.8	**9.7** ± 2.5
Male	**21.0** ± 2.2	**50.1** ± 6.0	**9.9** ± 3.3
Education			
Less than high school	**28.5** ± 7.0	**56.9** ± 15.3	**6.3** ± 4.8
High school graduate/GED	**27.1** ± 3.2	**52.2** ± 7.3	**9.1** ± 3.8
Some college or technical school	**20.2** ± 2.2	**58.5** ± 6.1	**11.4** ± 3.1
College graduate or beyond	**6.8** ± 1.2	**67.6** ± 7.8	**11.9** ± 4.4
Household income			
$35,000 or less	**25.1** ± 3.0	**56.5** ± 7.1	**6.2** ± 2.1
$35,001 to $50,000	**23.8** ± 4.5	**60.6** ± 10.6	**10.9** ± 5.1
$50,001 to $75,000	**20.5** ± 3.3	**51.4** ± 9.3	**12.0** ± 6.0
$75,001 or more	**12.3** ± 2.0	**55.3** ± 8.9	**9.8** ± 3.6

Source: Minnesota Adult Tobacco Survey, 2007

Past-year Quitters. Among all past-year smokers, 56.7±4.3 percent (about 392,000 smokers) are past-year quitters, meaning they either attempted to quit or successfully quit (Table 3-1). A major goal of Minnesota tobacco control programs is to encourage and assist smokers to quit. Since smokers usually must make more than one quit attempt before they are able to sustain smoking abstinence, an intermediate goal of Minnesota tobacco control programs is to encourage quit attempts among smokers. Therefore, MATS tracks the prevalence of quitting—whether successful or not—among smokers in the past year. Women (64.3±5.8 percent) are more likely to be past-year quitters than men (50.1±6.0 percent), a

statistically significant difference. There are no statistically significant differences in past-year quitting by age, education or income.

Successful Quitters. Among all past-year smokers, 9.8±2.1 percent (69,000 people) quit at the time of MATS 2007 (Table 3-1). Among this group of successful quitters, there are no statistically significant differences by age, gender, education and income—likely because of the small sample size.

Tobacco control programs in Minnesota are trying to help former smokers maintain longer periods without smoking, so MATS monitors the length of time since former smokers smoked regularly. Among all former smokers, 12.9±2.8 percent last smoked regularly between one and five years ago and 70.2±2.7 percent last smoked regularly five or more years ago. Thus, a high percentage of former smokers have been able to sustain their quit beyond the one-year marker.

Quitting Among Current Smokers

This section focuses on quit attempts among current smokers only, by looking separately at the past-year quitters among current smokers. Tobacco control programs in Minnesota are working to help current smokers become future quitters; therefore, understanding the quit attempts current smokers have already made in the recent past provides important information for planning.

In the past year, 52.4±4.6 percent of current smokers in Minnesota attempted to quit, defined as not smoking for one day or longer in the 12 months before the survey because they were trying to quit smoking. As shown in Table 3-2, women (60.5±6.4 percent) were more likely to try to quit than men (45.3±6.2 percent), a statistically significant difference. No statistically significant differences exist by age, education or income.

Among current smokers with a quit attempt in the past 12 months, nearly 70 percent made more than one attempt: 27.4±5.1 percent made two attempts, 17.5±4.2 percent made three attempts, and 22.7±5.1 percent made four or more attempts (Table 3-3). The fact that so many smokers make multiple attempts to quit demonstrates both high interest in quitting and the need for support in overcoming nicotine addiction.

Table 3-2. Current smokers with a quit attempt in the past 12 months, by selected demographic characteristics

Characteristics	Made a quit attempt %
Overall	**52.4** ± 4.6
Age	
18 to 24	**61.1** ± 10.9
25 to 44	**49.7** ± 8.1
45 to 64	**52.9** ± 6.5
65 or older	**46.4** ± 11.3
Gender	
Female	**60.5** ± 6.4
Male	**45.3** ± 6.2
Education	
Less than high school	**55.2** ± 16.1
High school graduate/GED	**47.4** ± 7.5
Some college or technical school	**53.5** ± 6.7
College graduate or beyond	**63.9** ± 8.9
Household income	
$35,000 or less	**54.1** ± 7.4
$35,001 to $50,000	**56.4** ± 11.9
$50,001 to $75,000	**44.5** ± 9.4
$75,001 or more	**50.8** ± 9.6

Source: Minnesota Adult Tobacco Survey, 2007

Table 3-3. Number of quit attempts in the past 12 months among current smokers with at least one quit attempt, by selected demographic characteristics

Characteristics	1 attempt	2 attempts	3 attempts	4 or more attempts	Row total
	%	%	%	%	%
Overall	**32.4** ± 6.5	**27.4** ± 5.1	**17.5** ± 4.2	**22.7** ± 5.1	**100**
Age					
18 to 24	**31.2** ± 14.4	**19.7** ± 10.5	**18.6** ± 11.1	**30.5** ± 16.0	**100**
25 to 44	**40.3** ± 11.9	**27.9** ± 9.0	**17.5** ± 6.6	**14.3** ± 6.7	**100**
45 to 64	**24.3** ± 7.5	**30.9** ± 7.9	**16.5** ± 6.9	**28.4** ± 7.8	**100**
65 or older	**27.4** ± 13.2	**26.0** ± 12.4	**20.1** ± 14.6	**26.4** ± 12.7	**100**
Gender					
Female	**37.1** ± 10.1	**25.4** ± 7.0	**15.2** ± 5.5	**22.4** ± 6.9	**100**
Male	**27.0** ± 7.0	**29.7** ± 7.3	**20.3** ± 6.5	**23.1** ± 7.6	**100**
Education					
Less than high school	**46.5** ± 29.3	**10.6** ± 8.2	**S**	**30.5** ± 22.3	**100**
High school graduate/GED	**33.9** ± 8.9	**24.7** ± 7.3	**19.0** ± 7.5	**22.4** ± 7.4	**100**
Some college or technical school	**27.9** ± 8.3	**33.9** ± 9.0	**17.4** ± 6.3	**20.7** ± 7.3	**100**
College graduate or beyond	**28.4** ± 12.3	**30.8** ± 12.9	**19.8** ± 10.4	**21.0** ± 16.7	**100**
Household income					
$35,000 or less	**35.3** ± 9.3	**29.4** ± 9.0	**12.8** ± 5.0	**22.5** ± 6.8	**100**
$35,001 to $50,000	**28.9** ± 23.6	**20.7** ± 10.8	**21.4** ± 12.7	**29.1** ± 14.6	**100**
$50,001 to $75,000	**26.9** ± 9.2	**33.1** ± 11.7	**27.7** ± 10.4	**12.2** ± 6.2	**100**
$75,001 or more	**45.9** ± 13.3	**23.3** ± 9.3	**17.2** ± 10.4	**13.6** ± 7.0	**100**

Source: Minnesota Adult Tobacco Survey, 2007

3.2.2 Awareness and Use of Quitting Programs and Medications

Minnesota is a national leader in providing accessible and effective tobacco cessation services statewide.

Behavioral Counseling to Stop Smoking

Stop-smoking telephone quitlines are an effective approach to smoking cessation. Tobacco users participate in a series of brief calls with tobacco cessation professionals to create personalized plans to quit. Combining counseling with medications leads to the greatest quit rates.[8] Quitlines are an effective approach to providing population access to tobacco dependence treatment.[9] Surveys of quitlines in North America estimate the current reach of quitlines to be between 1 percent to 2 percent of smokers served per year.[10]

In Minnesota, media campaigns are used to promote quitline services. These campaigns can reach a greater volume and broader cross-section of smokers than counseling programs that accept only referrals from a small group of high-risk clinic or hospital patients.

Through Call it Quits, a unique collaboration of Minnesota's major health plans and ClearWay Minnesota, free telephone counseling services are available to all Minnesotans. ClearWay Minnesota's QUITPLAN® Helpline provides free counseling and nicotine replacement therapy (NRT), such as the nicotine patch and gum, to Minnesotans who do not have coverage through their health insurance; insured callers are transferred directly to their health plan's quitline.

Every major health plan in Minnesota offers a stop-smoking telephone quitline at no cost to members. The health plans contract with various vendors to provide this service. Blue Cross began offering its stop-smoking program in May of 2000. Blue Cross initially recruited its members who smoke by using widespread television advertising that also encouraged norm change around tobacco use. Now the program recruits members through integration with other Blue Cross programs, such as disease management and high-risk pregnancy programs. On a much larger scale, Blue Cross has also sought to engage entire clinic and pharmacy systems in the state to identify and refer smokers into the program (as described in section 3.3). The Blue Cross program also directly mails NRT to members who participate in the stop-smoking program.

In addition to a statewide helpline, Clearway Minnesota also provides additional service options to Minnesota smokers. Services include centers that provide face-to-face tobacco counseling, a web-based program that provides support and interactive quit-smoking resources, group counseling sessions in workplaces, and community-tailored centers that serve specific populations. ClearWay Minnesota promotes QUITPLAN Services statewide through television, on signs at transit stops, radio, over the Internet and at venues such as the State Fair.

Stop-smoking Medications

Effective cessation medications are available. The U.S. Public Health Service's *Clinical Practice Guideline, Treating Tobacco Use and Dependence*: *2008 Update* describes the effectiveness of several FDA-approved medications to alleviate the symptoms of nicotine withdrawal.[11] Meta-analyses of clinical trials have demonstrated that NRT products such as the patch, gum, nasal spray, inhaler and lozenge effectively double or triple the odds of quitting over placebo. A similar review also demonstrated the effectiveness of a non-nicotine medication, bupropion (Zyban®).[12] The FDA recently approved varenicline (Chantix®), another effective non-nicotine medication.[13] Smokers may purchase some form of NRT (patch, gum and lozenge) over the counter but Zyban, Chantix, nicotine inhaler and nicotine nasal spray require a physician prescription. The Guideline urges insurance coverage for these effective stop-smoking medications.

Minnesota smokers have either some insurance coverage for or free access to quit-smoking medications. In Minnesota, the combined efforts of the major health plans and ClearWay Minnesota have greatly increased accessibility to stop-smoking medications since 1998. Minnesota health plans have increased coverage for stop-smoking medications for their fully insured members and encouraged large self-insured employer groups (who design their own benefits) to offer this coverage as well. For those without coverage or without health insurance, ClearWay Minnesota has provided free NRT since 2002 to smokers who also participate in behavioral counseling.

This section reports on awareness and use of evidence-based methods of smoking cessation, such as stop-smoking medications (prescription and over-the-counter) and programs, such as telephone quitlines.

Awareness of Quitting Assistance

This section focuses on awareness of free assistance to quit smoking. Although not measured in the 1999 and 2003 MATS, it will be important to track this indicator in the future to see how many smokers understand that resources are available to support their quit attempts.

Awareness of Availability of Quitting Assistance

Survey Question

- During the past 12 months, have you heard of any stop-smoking programs, such as a helpline, support group or website that offered free help to smokers who were trying to quit?

Among current smokers, 78.0±3.8 percent are aware of free assistance to quit smoking. Similar high levels of awareness (80.32±4.9 percent) are reported among former smokers who have quit in the past five years. No statistically significant differences exist in awareness by age, gender, education or income. Ideally, a high level of utilization of the available assistance would accompany such a high level of awareness of it.

Perceptions of Quitting Assistance

Perceptions of quitting assistance may affect smokers' interest in or willingness to use assistance. Since successful quitters have usually made multiple quit attempts before being successful, this section and the following section, about use of assistance, focus on current smokers who have tried to quit in the past year. These current smokers who have recently tried to quit are the most likely to make another attempt soon, and supporting this group of smokers in future attempts to quit is critical to Minnesota's tobacco control efforts.

Stop-smoking Medications

Survey Questions

- 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 you decided you wanted to quit, you would be able to quit without stop-smoking medications.

  Stop-smoking medications are too expensive.

  You don't know enough about how to use stop-smoking medications properly.

  Stop-smoking medications are too hard to get.

  Stop-smoking medications might harm your health.

Over half (55.4±6.4 percent) of current smokers who have tried to quit smoking in the past year believe that they could quit smoking without stop-smoking medications (Table 3-4). There is a large and significant difference by age. Among current smokers, 85.3±8.7 percent of 18-24-year-olds believe they can quit smoking without stop-smoking medications, compared with 50.6±11.5 percent of 25-44-year-olds, 45.8±8.7 percent of 45-64-year-olds, and 54.2±14.9 percent of the 65 or older group. The difference between the 18-24-year-olds and all the other age groups is significant. There are no significant differences by gender, education or income.

Table 3-4. Perceived ability to quit smoking without stop-smoking medications among current smokers who have tried to quit in the past 12 months, by selected demographic characteristics

Characteristics	Could quit without medication %
Overall	**55.4** ± 6.4
Age	
18 to 24	**85.3** ± 8.7
25 to 44	**50.6** ± 11.5
45 to 64	**45.8** ± 8.7
65 or older	**54.2** ± 14.9
Gender	
Female	**52.8** ± 9.5
Male	**58.5** ± 8.0
Education	
Less than high school	**51.5** ± 28.1
High school graduate/GED	**60.1** ± 8.8
Some college or technical school	**52.5** ± 9.1
College graduate or beyond	**56.8** ± 14.8
Household income	
$35,000 or less	**57.5** ± 9.1
$35,001 to $50,000	**46.1** ± 18.8
$50,001 to $75,000	**49.9** ± 11.5
$75,001 or more	**61.0** ± 12.2

Source: Minnesota Adult Tobacco Survey, 2007

Other perceptions of stop-smoking medications among current smokers who have tried to quit in the past year include:

- 72.6±5.8 percent believe that stop-smoking medications are too expensive.
- 43.5±6.1 percent believe that they do not know enough about stop-smoking medications to use them properly.
- 31.4±6.1 percent believe (incorrectly) that stop-smoking medications might harm their health.
- 15.1±4.1 percent believe that stop-smoking medications are too hard to get.

No statistically significant differences exist by age, gender, education or income on the above items. These results suggest that addressing actual or perceived costs for stop-smoking medications and educating smokers about their use remain as important objectives for the tobacco control community.

Use of Quitting Assistance

Types of Quitting Assistance

Smokers can choose from many types of assistance. The two major types are stop-smoking medications and behavioral counseling. MATS findings describe the results for each specific type of assistance, and some key summary measures of assistance:

- **Use of any assistance**: use of any type of stop-smoking medication or behavioral counseling
- **Use of any medications:** use of at least one of the nicotine replacement therapy medications (nicotine gum, patch, nasal spray, inhaler, or lozenge) or the non-NRT medications (Zyban®/bupropion or Chantix® /varenicline)
- **Use of any nicotine replacement therapy**
- **Use of any behavioral counseling:** use of a stop-smoking clinic or class, a telephone quitline, clinician counseling, or a web-based counseling service

Survey Questions

- The last time you tried to quit smoking, did you use any of the following products? Did you use…

  Nicotine gum?

  A nicotine patch?

  A nicotine nasal spray?

  A nicotine inhaler?

  Nicotine lozenges?

  A prescription medication like Zyban, Wellbutrin or Chantix to help you quit smoking?

- The last time you tried to quit smoking, did you use a stop-smoking clinic or class?
- The last time you tried to quit smoking, did you use a stop-smoking telephone help line?
- The last time you tried to quit smoking, did you use one-on-one counseling from a doctor, nurse or other health professional?
- The last time you tried to quit smoking, did you use an on-line or web-based counseling service?

All of the estimates appearing in the following discussion about use of quitting assistance are based on current smokers' last quit attempt in the past 12 months.

Any Assistance. Nearly half (48.5±6.2 percent) of current smokers with a quit attempt in the past 12 months used some form of quitting assistance. This also means that about half of current smokers who have tried to quit in the past year did not use assistance as defined by MATS. They may have used techniques not based on evidence, or nothing at all. No statistically significant differences exist in the use of assistance by age, gender, education or income.

Stop-smoking Medications. Nearly half (45.5±6.1 percent) of current smokers with a quit attempt in the past 12 months used some kind of stop-smoking medication in their last quit attempt (Table 3-5). There are significant differences by age. Smokers in the three oldest age groups—25-44 (45.4±10.7 percent), 45-64 (52.2±8.6 percent) and 65 or over (59.3±13.5 percent)—were all more likely than smokers in the youngest age group, 18-24 (28.3±13.7 percent) to use quit medications. No significant differences were found in the use of quit medications by gender, education or income. The very low rate (28.0±17.8 percent), however, for those with less than a high school education borders on significance and may warrant further monitoring.

Nearly 40 percent (38.7±5.8 percent) of current smokers with a quit attempt in the past 12 months used some form of nicotine replacement therapy (Table 3-6). Smokers more commonly used the three over-the-counter NRT medications (patch, gum and lozenges) than the prescription medication (inhalers). The patch was used by 25.5±5.1 percent of current smokers who have tried to quit in the past 12 months, followed by gum (13.4±3.4 percent), lozenges (7.3±2.7 percent), and inhalers (3.5±1.8 percent). (Although a question was asked about use of a nicotine nasal spray, no current smokers who had tried to quit in the past 12 months used it, and very few former smokers used it.) Only 15.4±4.0 percent of smokers with a quit attempt in the past 12 months used non-NRT prescription medications. However, this level is matched by the level of use of any of the NRT medications, except for the patch.

Table 3-5. Use of any stop-smoking medication among current smokers who tried to quit in the past 12 months, by selected demographic characteristics

Characteristics	Used medication
	%
Overall	**45.5** ± 6.1
Age	
18 to 24	**28.3** ± 13.7
25 to 44	**45.4** ± 10.7
45 to 64	**52.2** ± 8.6
65 or older	**59.3** ± 13.5
Gender	
Female	**46.1** ± 9.0
Male	**44.8** ± 8.0
Education	
Less than high school	**28.0** ± 17.8
High school graduate/GED	**51.2** ± 9.1
Some college or technical school	**45.9** ± 9.0
College graduate or beyond	**42.6** ± 14.1
Household income	
$35,000 or less	**42.8** ± 9.0
$35,001 to $50,000	**43.7** ± 17.3
$50,001 to $75,000	**53.6** ± 11.6
$75,001 or more	**48.5** ± 12.9

Source: Minnesota Adult Tobacco Survey, 2007

Table 3-6. Use of various stop-smoking medications among current smokers who have tried to quit in the past 12 months

Type of medication	%
Use of any medication[†]	**45.5** ± 6.1
Use of any nicotine replacement therapy[†]	**38.7** ± 5.8
Use of nicotine patch	**25.5** ± 5.1
Use of nicotine gum	**13.4** ± 3.4
Use of nicotine lozenges	**7.3** ± 2.7
Use of nicotine inhaler	**3.5** ± 1.8
Use of prescription medication	**15.4** ± 4.0

[†] Individual percentages sum to more than overall percentage because respondents could have used more than one type of medication.

Source: Minnesota Adult Tobacco Survey, 2007

Behavioral Counseling. Overall, 14.9±4.0 percent of current smokers with a quit attempt in the past year used some kind of behavioral quit-smoking counseling (Table 3-7). The only significant difference among subgroups was that young adults aged 18-24 almost never used behavioral counseling (approximately 1 percent, compared with 14 percent to 22 percent for the other age groups). The most common form of behavioral counseling was one-on-one counseling from a health professional, used by 9.8±3.2 percent of current smokers who tried to quit in the past 12 months. Less than 5 percent of current smokers used other forms of behavioral assistance.

Table 3-7. Use of various forms of behavioral counseling to aid quitting, among current smokers who have tried to quit in the past 12 months

Type of behavioral counseling	%
Use of any non-medication assistance[†]	**14.9** ± 4.0
Use of one-on-one counseling from a health professional	**9.8** ± 3.2
Use of a stop-smoking clinic or class	**4.4** ± 2.0
Use of on-line or web-based counseling	**2.9** ± 2.3
Use of a quit-smoking telephone helpline	**2.2** ± 1.0
Use of some other program, product or service	**1.5** ± 1.0

[†] Individual percentages sum to more than overall percentage because respondents could have used more than one type of behavioral counseling.

Source: Minnesota Adult Tobacco Survey, 2007

Payment for Assistance

MATS further assesses how Minnesotans paid for these medications by asking a follow-up question about payment to every person who used each medication. The analysis combines current smokers who tried to quit in the past year and former smokers who last smoked regularly in the past year in order to assess the entire group of people who potentially could have used these medications in the past year.

Payment for Assistance and Willingness to Use Medications

Survey Questions

For each form of assistance the respondent used, MATS asked a follow-up question about payment for medication used in the last quit attempt. These questions all had the same response options.

- Who paid for the nicotine gum? Did…
- Who paid for your nicotine patch? Did...
- Who paid for your nicotine nasal spray? Did...
- Who paid for your nicotine inhaler? Did...
- Who paid for your nicotine lozenges? Did...
- Who paid for your prescription medication? Did...

  you pay for it completely, your insurance pay for it completely, you and your insurance company each pay part of the cost, or was it free?

In addition, current smokers were asked about their willingness to use assistance if cost were not an issue.

- If you were trying to quit smoking and cost was not an issue, would you use any programs, products, or medicine to help you quit?

Among all current smokers who tried to quit and former smokers who did quit in the past year and who used some type of stop-smoking medication, 57.1±7.0 percent received assistance in paying for that medication in their last quit attempt (Table 3-8). Assistance in paying was most common for prescription medications (both NRT and non-NRT). Among all current and former smokers who used prescription medications in their last quit attempt during the past year, 84.2±6.4 percent received assistance in paying for them. More than a third (42.1±7.8 percent) of those who used some type of NRT (both prescription and non-prescription) received assistance in paying for that medication. There are no statistically significant differences in receiving assistance in paying for medications by age, gender, education, income or smoking status.

Table 3-8. Receipt of any assistance in paying for various forms of stop-smoking medication,† among current and former smokers with a quit attempt in the past 12 months, by selected demographics

Characteristics	Received payment assistance for any form of medication	Received payment assistance for prescription medication	Received payment assistance for NRT
	%	%	%
Overall	**57.1** ± 7.0	**84.2** ± 6.4	**42.1** ± 7.8
Age			
18 to 24	**44.6** ± 27.1	**96.8** ± 6.6	**29.7** ± 25.1
25 to 44	**51.8** ± 11.5	**88.5** ± 9.5	**40.4** ± 12.4
45 to 64	**66.9** ± 8.8	**85.8** ± 7.9	**47.7** ± 11.6
65 or older	**47.1** ± 17.7	**53.3** ± 28.4	**40.1** ± 19.8
Gender			
Female	**58.7** ± 9.5	**86.2** ± 7.6	**40.9** ± 10.2
Male	**55.4** ± 10.4	**81.9** ± 10.7	**43.4** ± 11.6
Education			
Less than high school	**78.6** ± 16.5	**83.9** ± 27.0	**67.5** ± 22.6
High school graduate/GED	**57.8** ± 11.4	**85.7** ± 9.2	**43.9** ± 12.9
Some college or technical school	**51.6** ± 11.6	**83.0** ± 12.2	**37.7** ± 12.2
College graduate or beyond	**53.5** ± 16.0	**78.8** ± 17.1	**30.2** ± 15.0
Household income			
$35,000 or less	**66.4** ± 10.7	**75.4** ± 15.6	**60.1** ± 12.2
$35,001 to $50,000	**60.9** ± 15.2	**89.5** ± 9.2	**50.5** ± 18.6
$50,001 to $75,000	**41.3** ± 13.8	**79.0** ± 15.3	**28.0** ± 14.5
$75,001 or more	**44.1** ± 17.5	**82.6** ± 16.3	**19.6** ± 13.8
Smoking status			
Current smokers	**55.5** ± 7.9	**90.3** ± 5.1	**39.7** ± 8.4
Former smokers	**64.6** ± 14.6	**68.2** ± 17.7	**58.4** ± 19.4

† Each column includes only those who used the stated type of medication in their most recent quit attempt.

Source: Minnesota Adult Tobacco Survey, 2007

Willingness to Use Quit-smoking Assistance

Among all current smokers, willingness to use some type of quit-smoking assistance is high. About 70 percent (70.7±4.3 percent) of current smokers say they would be willing to use some form of assistance if cost were not an issue (Table 3-9). There are statistically significant differences in willingness to use assistance by age and gender. Young adult smokers aged 18-24 (58.2±11.7 percent) are less likely to be willing to use assistance than smokers aged 45-64 (76.3±5.1 percent). Women (77.4±5.2 percent) are more willing to use it than men (65.1±6.4 percent).

Table 3-9. Willingness to use a program, product or medication to help quit smoking if cost were not an issue, among current smokers, by selected demographic characteristics

Characteristics	Willing to use a program, product or medication
	%
Overall	**70.7** ± 4.3
Age	
18 to 24	**58.2** ± 11.7
25 to 44	**72.0** ± 7.5
45 to 64	**76.3** ± 5.1
65 or older	**60.3** ± 11.5
Gender	
Female	**77.4** ± 5.2
Male	**65.1** ± 6.4
Education	
Less than high school	**66.4** ± 15.1
High school graduate/GED	**69.4** ± 7.4
Some college or technical school	**74.9** ± 5.8
College graduate or beyond	**66.6** ± 11.1
Household income	
$35,000 or less	**68.2** ± 6.7
$35,001 to $50,000	**76.3** ± 8.7
$50,001 to $75,000	**71.8** ± 11.4
$75,001 or more	**72.6** ± 8.6

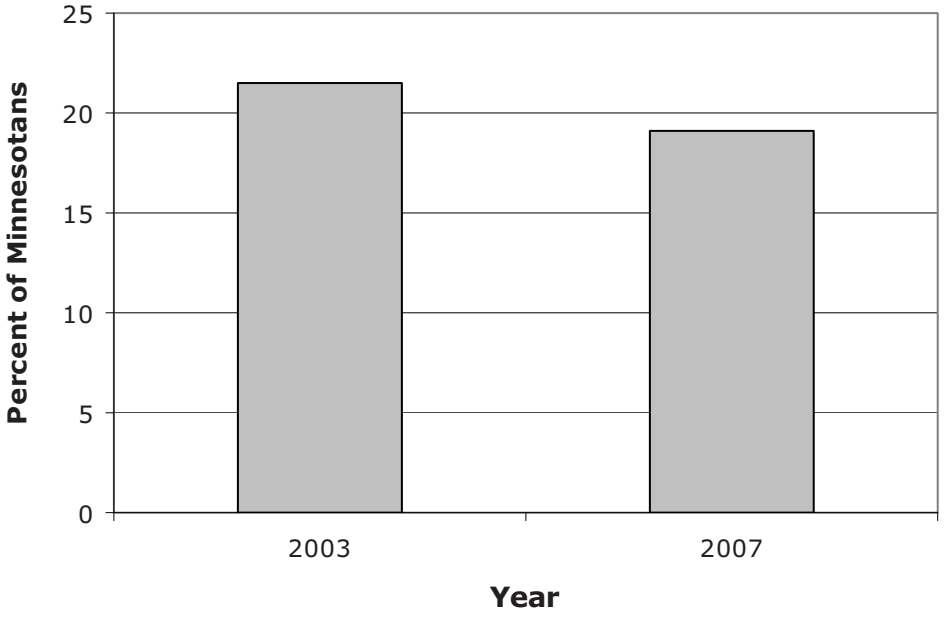
Source: Minnesota Adult Tobacco Survey, 2007

3.2.3 Past-year Smoking, Quitting and Successful Quitting, 2003 to 2007

Past-year Smokers. In the 12 months before MATS 2007, 19.1±1.4 percent of Minnesotans smoked cigarettes (Figure 3-1); these past-year smokers include both current smokers and former smokers who quit in the past year. This represents a statistically significant decrease of 2.4±2.1 percentage points from the percentage of past-year smokers in 2003, 21.5±1.6 percent.

Past-year Quitters. Among all past-year smokers, 56.7±4.3 percent are past-year quitters in 2007, meaning they either attempted to quit or quit successfully. This decrease of 3.3±6.0 percentage points, from 60.0±4.2 percent in 2003, is not statistically significant.

Figure 3-1. Past-year smokers, from 2003 to 2007



			Change over time
	2003	2007	2003 to 2007
Percent of Minnesotans	21.5 ± 1.6	19.1 ± 1.4	-2.4 ± 2.1 %*

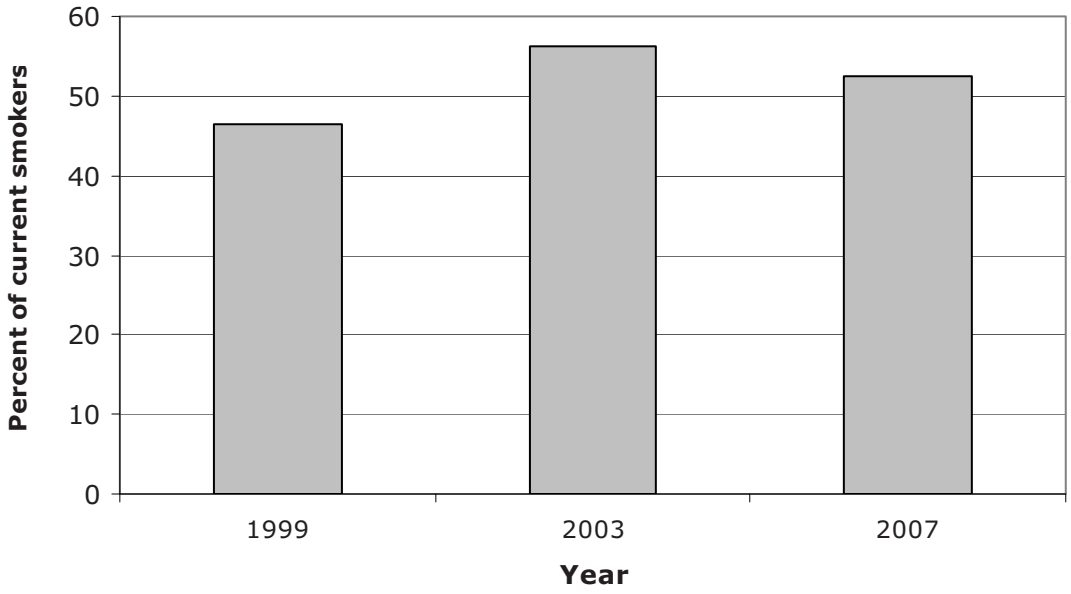
*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

Past-year Successful Quitters. There is no change between 2003 (9.7±1.8 percent) and 2007 (9.8±2.1 percent) in the percentage of Minnesota past-year smokers who successfully quit.

Current Smokers with Quit Attempts. In 2007, 52.4±4.6 percent of current smokers in Minnesota attempted to quit for one day or longer in the 12 months before the survey because they were trying to quit (Figure 3-2). Although there is an increase from 1999 to 2007, it is not statistically significant. There is also a small, but not statistically significant, decline from 2003 and 2007.

Figure 3-2. Current smokers who have tried to quit in the past 12 months, from 1999 to 2003



				Change over time	
	1999	2003	2007	1999 to 2007	2003 to 2007
Percent of current smokers	46.3 ± 4.4	56.3 ± 4.5	52.4 ± 4.6	6.0 ± 6.4 %	-3.9 ± 6.4 %

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Use of Assistance

In 2007, 45.5±6.2 percent of current smokers with a quit attempt in the previous 12 months used some form of assistance in their most recent quit attempt. This is a statistically significant increase of 13.0±6.7 percentage points from 34.6±6.7 in 1999. An even greater increase of 14.6±7.7 percentage points occurred from 2003 (30.9±4.8 percent) to 2007.

Stop-smoking Medications and Behavioral Counseling. There was a change in the wording of the questions about use of stop-smoking medications and behavioral counseling in the 2003 and 2007 surveys, so the information was not collected in the same way in all three MATS. A full description of this wording change is included in the *Minnesota Adult Tobacco Survey 2007 Methodology Report*, which can be found

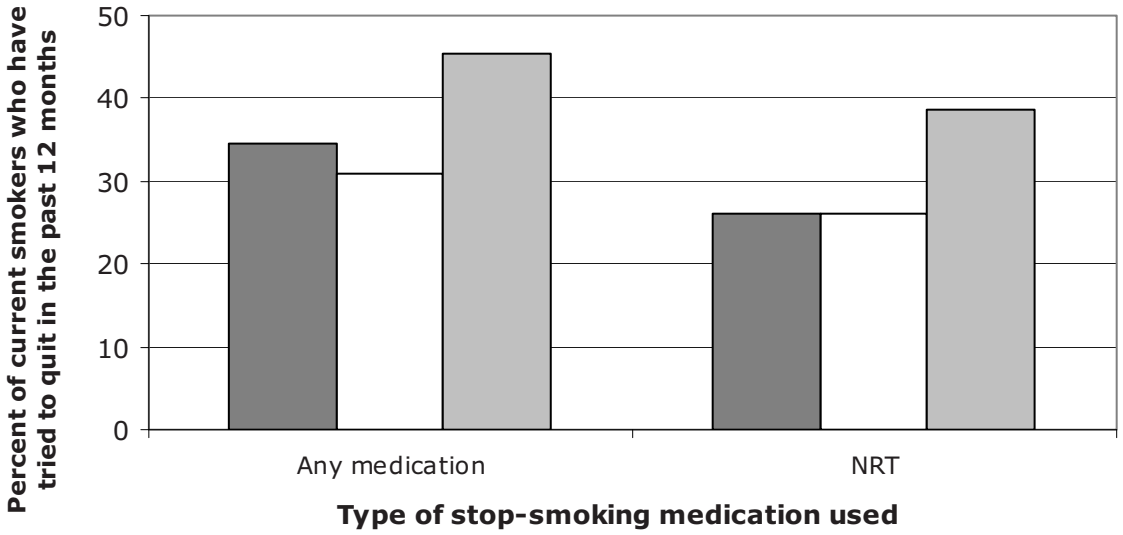
at www.mnadulttobaccosurvey.org. The results of the comparisons involving stop-smoking medications generally, and NRT medications specifically, should be interpreted with some caution. However, the differences in the wording of the questions likely had a small effect on MATS results.

In 2007, 45.5±6.1 percent of current smokers with a quit attempt in the previous 12 months used some kind of stop-smoking medication in their most recent quit attempt (Figure 3-3). This is a statistically significant increase of 10.9±9.0 percentage points over 1999, when 34.6±6.7 percent of current smokers with a quit attempt in the previous 12 months used some form of stop-smoking medication. There was a slight decline between 1999 and 2003, and then use of medications climbed. As a result, there was an even larger and statistically significant increase between 2003 and 2007 of 14.6±7.7 percentage points.

In 2007, 38.7±5.8 percent of current smokers with a quit attempt in the previous 12 months used some form of nicotine replacement therapy (Figure 3-3). The percentage of smokers who used NRT did not change much between 1999 and 2003. However, between 2003 and 2007, NRT use increased by 12.6±7.3 percentage points. This change is statistically significant. All of this change occurred between 2003 and 2007.

In 2007, 14.9±4.0 percent of current smokers with a quit attempt in the past year used some kind of behavioral smoking cessation counseling (such as a class or program) in their last attempt (Figure 3-4). This large increase of 11.3±4.4 percentage points from the low 2003 rate of 3.6±1.8 percent is statistically significant.

Figure 3-3. Use of any stop-smoking medication and of NRT among current smokers who have tried to quit in the past 12 months, from 1999 to 2007

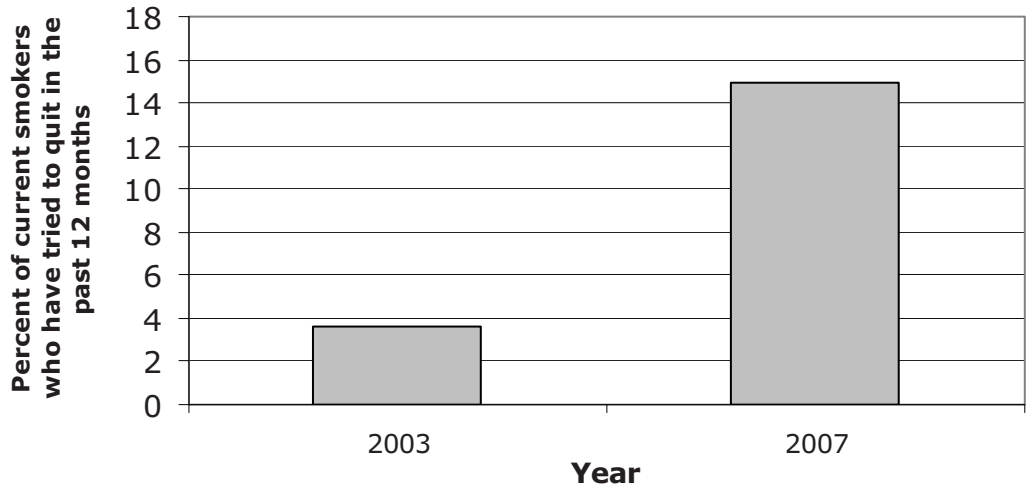


Year	Any medication	NRT
1999	34.6 ± 6.7	26.2 ± 6.0
2003	30.9 ± 4.8	26.0 ± 4.4
2007	45.5 ± 6.1	38.7 ± 5.8
Change over time		
1999 to 2007	10.9 ± 9.0 %*	12.5 ± 8.3 %*
2003 to 2007	14.6 ± 7.7 %*	12.6 ± 7.3 %*

Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Figure 3-4. Use of behavioral counseling by current smokers who have tried to quit in the past 12 months, from 2003 to 2007



			Change over time
	2003	2007	2003 to 2007
Percent of current smokers who have tried to quit in the past 12 months	3.6 ± 1.8	14.9 ± 4.0	11.3 ± 4.4 %*

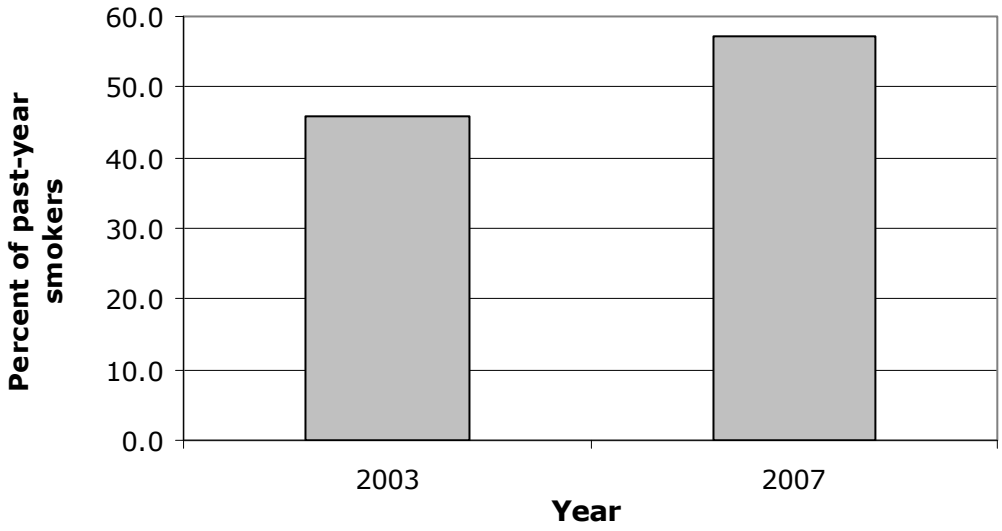
*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

Payment for Assistance

In 2007, among all current smokers who tried to quit and former smokers who did quit in the past 12 months and who used some type of stop-smoking medication, 57.1±7.0 percent received assistance in paying for that medication in their last quit attempt (Figure 3-5). This is a statistically significant increase of 11.2±10.1 percentage points from MATS 2003, when 46.0±7.3 percent of this group received assistance in paying for stop-smoking medication.

Figure 3-5. Receipt of payment assistance for stop-smoking medication among past-year smokers with a quit attempt† in the past 12 months, from 2003 to 2007



			Change over time
	2003	2007	2003 to 2007
Percent of past-year smokers	46.0 ± 7.3	57.1 ± 7.0	11.2 ± 10.1 %*

†For smokers who used stop-smoking medication in their most recent quit attempt.

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

3.3 Assistance from Health Care Providers

Smokers listen when physicians—and other health care providers—advise them to quit. Smokers cite a physician's advice to quit as an important motivator for attempting to stop smoking.[14]

In the United States, at least 70 percent of smokers see a physician each year and more than 50 percent see a dentist.[15] Smokers also see several other types of providers, such as nurses and pharmacists. A published study from MATS 2003 demonstrated that having two or more types of health professionals asking about tobacco use more than doubled the odds that a cigarette smoker would have quit in the previous year.[16] This finding argues strongly for the need to engage the entire health care system in improving delivery of tobacco treatment services.

The 2008 U.S. Public Health Service (PHS) Guideline strongly recommends that physicians and other providers implement five evidence-based strategies to help smokers quit.[17] However, as the 2008 PHS Guideline notes, physicians nationwide have been slow to implement those strategies. Even though many health plans cover one-on-one tobacco cessation counseling, providers often lack the time or training to complete all 5As (Ask, Advise, Assess, Assist and Arrange). To improve the likelihood of widespread and effective physician intervention, the five-step 5As model is sometimes streamlined to a three-step model (Ask, Advise and Refer). Every individual should still be asked about smoking status, and current smokers should be advised to quit. The physician or other provider should then refer the patient to an appropriate cessation counseling program. The cessation counselor, rather than the health care provider, assesses readiness to quit, assists in developing a quit plan, and follows up with medication and support. The physician or other provider may collaborate by prescribing that medication.

The Minnesota Fax Referral Program, an initiative of Call it Quits, Minnesota's quitline collaborative, supports providers in asking patients if they smoke, advising them to quit, and referring them to an existing stop-smoking program. The MATS 2007 questions capture the outcomes of this three-step model rather than the 5As model.

In the early years of the quitline collaboration, Blue Cross, other major health plans and ClearWay Minnesota produced and distributed Quit Cards, which provided contact information for each health plan's phone-based quitline and the QUITPLAN Helpline. In addition, Blue Cross engaged its unique relationships with health care providers to initiate and fund multiple efforts to simplify and encourage provider referrals. More recently, the Call it Quits collaborative has implemented the Minnesota Clinic Fax Referral Program. This new program enables Minnesota health care providers to use a single form and fax number to refer *any* consenting patient who uses tobacco to a telephone quitline, regardless of the patient's health care coverage. The referral is sent to the appropriate stop-smoking resource, and the patient receives a call from the quit-smoking program explaining the program and inviting enrollment. After a successful pilot with a large multi-specialty clinic in 2005, the program was made available in every clinic in the state in October 2007.

The Call it Quits collaboration also piloted implementation of the Fax Referral Program in dental offices in December 2006 and the program was made available to every dentist office in Minnesota in June 2008.

Two other interventions by Blue Cross have created systems that reward providers for implementing best practices. First, Blue Cross' Recognizing Excellence program, a performance-based provider payment strategy, has rewarded provider groups that meet high standards for documenting the tobacco use status of every patient and advising patients who use tobacco to quit since 2003. Second, Blue Cross has engaged non-physician health care providers by implementing the Smoking Cessation Referrals in Pharmacies (SCRIPS), another systems-level recruitment method. Using electronic prompts and incentives, the program encourages pharmacists to invite Blue Cross members who fill a stop-smoking medication prescription to enroll in Blue Cross' free stop-smoking telephone quitline. Members who agree to be referred receive a call inviting them to enroll.

This section examines the smoker's path to quitting through treatment received from a health care provider for four different types of providers. Section 3.3.1 examines the Minnesota smokers who see each type of health care provider and their demographic characteristics. Section 3.3.2 describes how well Minnesota smokers are being identified and encouraged to quit by their providers. Section 3.3.3 describes whether smokers are being connected by their providers to the effective treatments available in Minnesota. Section 3.3.4 compares these findings to 2003 results where data are available.

3.3.1 Visits to Providers

Visits to Specific Health Care Providers

MATS defines health care providers broadly, including any physician, nurse, dental practitioner or pharmacist. The following terms will be used throughout this report.

Doctor refers to medical doctors, including specialists.

Nurse refers to nurses or nurse practitioners.

Dentist refers to dentists or dental hygienists.

Pharmacist refers to pharmacists or pharmacy technicians.

Visit to any health care provider in the last 12 months: A person is defined as having made at least one visit to a health care provider in the last 12 months if he or she answered "yes" to at least one of the provider questions below.

Visit to more than one type of health care provider in the last 12 months: A person is defined as having made a visit to more than one type of health care provider in the last 12 months if he or she answered "yes" to at least two of the provider questions below.

Survey Questions

- I am going to read a list of different types of health care providers. Please tell me if you have visited any of them about your own health in the last 12 months. Did you visit ...

  A medical doctor?

  A nurse or nurse practitioner?

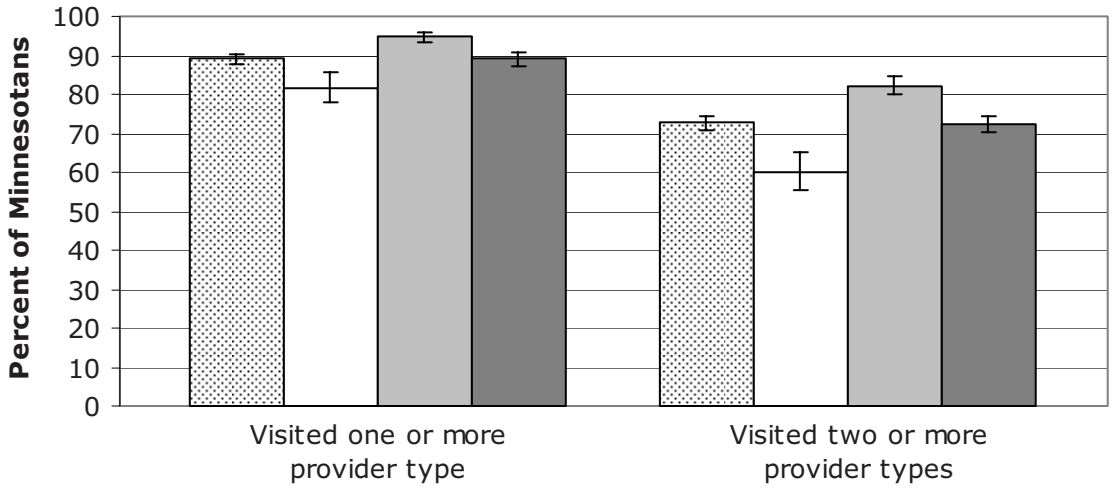
  A pharmacist or pharmacy technician?

  A dentist or dental hygienist?

Visits to Any Providers by All Minnesotans

Visit to Any Provider. Nearly 90 percent (89.1±1.3 percent) of Minnesotans saw a health care provider in the last 12 months, while 81.7±3.7 percent of smokers saw a provider (Figure 3-6). Therefore, provider interventions offer the opportunity to give most smokers support for quitting from a health care provider. In comparison, 89.0±1.8 percent of never smokers and 94.6±1.5 percent of former smokers saw a provider in the last 12 months. These differences are all statistically significant.

Figure 3-6. Minnesotans who visited a health care provider in the last 12 months, by number of provider types visited and smoking status



Smoking status	Visited one or more provider types	Visited two or more provider types
Overall	89.1 ± 1.3	72.6 ± 1.6
Current smokers	81.7 ± 3.7	60.2 ± 4.7
Former smokers	94.6 ± 1.5	82.2 ± 2.3
Never smokers	89.0 ± 1.8	72.2 ± 2.1

Source: Minnesota Adult Tobacco Survey, 2007

Visits to Multiple Types of Providers. Smoking cessation interventions delivered by multiple types of clinicians increase abstinence rates relative to those produced by interventions where there is no clinician.[18] Analysis of data from MATS 2003 revealed that when two or more types of health care providers asked about tobacco use, the odds that a cigarette smoker will have quit in the previous year more than doubled.[19]

Nearly three-quarters (72.6±1.6 percent) of Minnesotans saw two or more types of providers in the last 12 months (Figure 3-6). Only 60.2±4.7 percent of smokers saw two or more types of providers, significantly lower than 72.2±2.1 percent of never smokers and 82.2±2.3 percent of former smokers. Relative to all Minnesotans, smokers are even less likely to have seen two or more types of providers in the last 12 months than they are to have seen a provider at all.

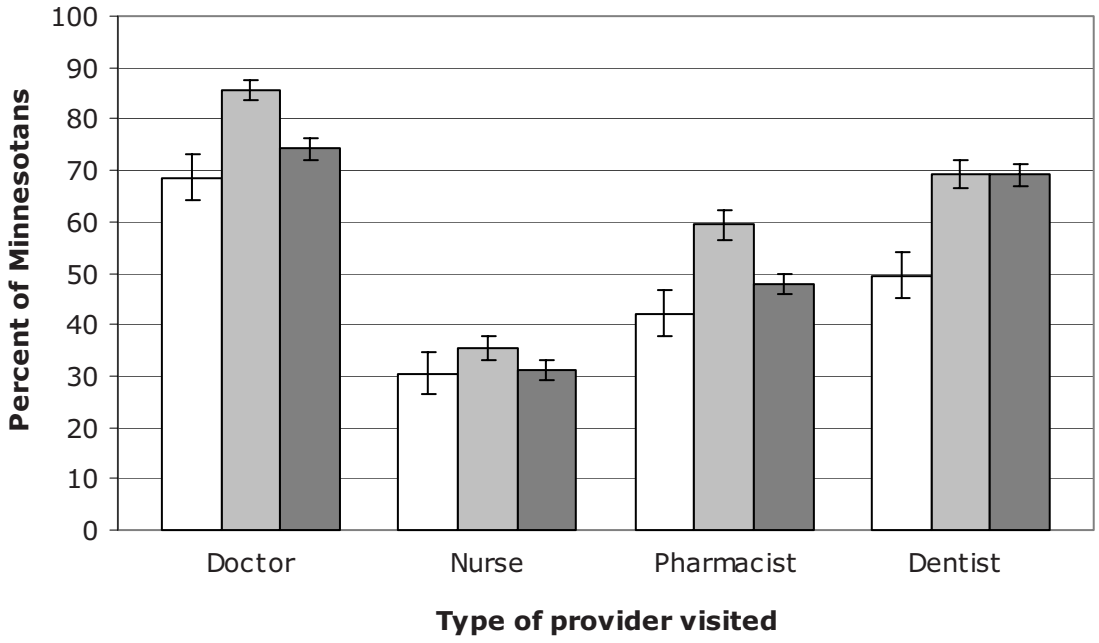
Visits to Specific Types of Providers. The percentage of all Minnesotans who have visited a provider in the last 12 months varies considerably by the type of provider, decreasing from 76.1±1.6 percent seeing a doctor, to 65.9±1.6 percent visiting a dentist, to 49.8±1.6 percent using a pharmacist, and only 32.0±1.4 percent seeing a nurse. These differences are all statistically significant.

Visits to Providers by Smokers

The statistics about Minnesotans seeing health care providers are most useful as points of comparison with smokers' use of health care providers. The rest of this section focuses on smokers' visits with health care providers.

As previously noted, 81.7±3.7 percent of current smokers—about 520,000 smokers—saw a provider in the last 12 months. Smokers visit each type of provider less often than nonsmokers do, and they show the same declining pattern across provider types mentioned at the end of the preceding section. This is consistent with the patterns seen for use of any provider. Figure 3-7 shows the comparative use of the different providers for current, former and never smokers. Nearly 70 percent of smokers (68.5±4.5 percent, or 434,000 smokers) saw a doctor in the last 12 months; 30.5±4.0 percent, or 192,000 smokers, saw a nurse; 42.2±4.6 percent, or 267,000 smokers, used a pharmacist; and 49.6±4.6 percent, or 314,000 smokers, went to a dentist. However, only a few of the differences between the percentages of smokers and never smokers seeing the various provider types are statistically significant. The largest significant differences occur between current smokers and former smokers in the percentages of each who saw a doctor, a dentist and a pharmacist, with about 15 percent to 20 percentage points fewer among smokers seeing these types than did former smokers.

Figure 3-7. Minnesotans who visited a health care provider in the last 12 months, by provider type and smoking status



Smoking status	Doctor	Nurse	Pharmacist	Dentist
Current smokers	68.5 ± 4.5	30.5 ± 4.0	42.2 ± 4.6	49.6 ± 4.6
Former smokers	85.6 ± 2.1	35.4 ± 2.5	59.4 ± 2.8	69.3 ± 2.7
Never smokers	74.3 ± 2.1	31.0 ± 1.9	47.9 ± 2.1	69.2 ± 2.1

Source: Minnesota Adult Tobacco Survey, 2007

Since this section focuses on the supportive effect of health care providers on quitting, it is worthwhile to examine the smokers who used each provider type by age, gender, education and income. Table 3-10 presents the percentage of each demographic group of smokers who used any providers, doctors, nurses, pharmacists and dentists, respectively. Individuals may have used more than one type of provider, so percentages sum to more than 100 percent across each row.

Table 3-10. Health care provider visits in the last 12 months among current smokers, for various provider types and by selected demographic characteristics

Characteristics	Provider type				
	Any provider	Doctor	Nurse	Pharmacist	Dentist
	%	%	%	%	%
Overall	**81.7** ± 3.7	**68.5** ± 4.5	**30.5** ± 4.0	**42.2** ± 4.6	**49.6** ± 4.6
Age					
18 to 24	**71.7** ± 10.3	**60.9** ± 11.2	**37.1** ± 11.7	**23.6** ± 8.2	**47.3** ± 11.6
25 to 44	**78.9** ± 6.9	**65.3** ± 8.0	**32.3** ± 6.9	**46.8** ± 8.0	**48.5** ± 8.0
45 to 64	**88.6** ± 3.3	**73.9** ± 5.8	**24.6** ± 5.1	**44.4** ± 6.6	**53.0** ± 6.5
65 or older	**88.3** ± 7.3	**82.3** ± 8.5	**34.2** ± 10.8	**41.2** ± 11.0	**43.5** ± 11.7
Gender					
Female	**92.4** ± 2.7	**84.4** ± 4.2	**38.5** ± 6.3	**53.3** ± 6.8	**52.4** ± 6.8
Male	**72.6** ± 6.1	**54.9** ± 6.5	**23.6** ± 5.2	**32.7** ± 6.1	**47.2** ± 6.4
Education					
Less than high school	**85.4** ± 8.1	**77.4** ± 10.7	**26.6** ± 13.5	**29.7** ± 13.5	**32.5** ± 14.7
High school graduate/GED	**75.1** ± 7.0	**59.5** ± 7.9	**28.0** ± 6.1	**38.4** ± 7.6	**47.3** ± 7.6
Some college or technical school	**85.9** ± 5.2	**73.0** ± 6.3	**31.3** ± 6.3	**47.3** ± 6.7	**51.5** ± 6.7
College graduate or beyond	**89.8** ± 5.5	**78.3** ± 7.3	**43.4** ± 10.9	**54.7** ± 10.2	**72.6** ± 7.8
Household income					
$35,000 or less	**83.3** ± 4.9	**73.7** ± 6.0	**38.4** ± 7.1	**44.7** ± 7.6	**38.0** ± 7.0
$35,001 to $50,000	**69.3** ± 11.2	**61.7** ± 11.7	**26.8** ± 9.0	**37.2** ± 10.5	**35.5** ± 10.0
$50,001 to $75,000	**88.1** ± 5.4	**65.0** ± 10.5	**28.6** ± 8.6	**42.8** ± 10.3	**62.1** ± 9.1
$75,001 or more	**84.6** ± 7.4	**68.4** ± 9.7	**25.4** ± 7.9	**43.7** ± 9.4	**67.6** ± 9.0

Source: Minnesota Adult Tobacco Survey, 2007

There are few major differences among the major demographic subgroups of smokers in the rates at which they encounter different types of health care providers (Table 3-10).

- There is a pronounced, statistically significant difference between female and male smokers for doctors, nurses and pharmacists, with women seeing them at a much higher rate than men.
- Use of pharmacists and dentists increases with educational level.
- Lower income smokers visit a dentist at a lower rate than higher income smokers.

3.3.2 Interventions with Smokers: The Ask, Advise and Refer Model in Various Provider Settings

The MATS 2007 questions capture the outcomes of the three-step model (Ask, Advise and Refer) rather than the 5As model. The rest of this section examines implementation of this tobacco treatment model by different types of health professionals.

The Ask, Advise and Refer Model in MATS

MATS assesses the three-step Ask, Advise and Refer model, adapted from the 5As approach for treating smoking in a clinical setting. This streamlined model encourages providers to ask and advise. "Refer" describes how providers should encourage patients to use behavioral counseling and stop-smoking medications. MATS measured the Ask, Advise and Refer model using the following questions.

Survey Questions

Ask

- In the past 12 months, did any {INSERT TYPE OF PROVIDER SEEN} you saw ask if you smoke?

Advise

- In the past 12 months, did any {INSERT TYPE OF PROVIDER SEEN} you saw advise you not to smoke?

Refer

- In the past 12 months, did any {INSERT TYPE OF PROVIDER SEEN} you saw recommend any product or prescription for a medication to help you quit smoking?
- In the past 12 months, did any {INSERT TYPE OF PROVIDER SEEN} you saw suggest that you seek help to quit smoking using a quit-smoking program, such as a helpline, a class or group, or an online website or program?

  If Yes to the above:

- Did this person help you access that quit smoking program?

Implementation of Ask, Advise and Refer Model in Minnesota

The next sections look at the extent to which Minnesota smokers experienced each of the steps in the Ask, Advise and Refer model, first from any provider type and then from each of the four provider types individually.

These results appear in Table 3-11. The percentages are smokers who received the activity (indicated in each table row) from the provider type indicated at the top of each column, as a percentage of those *smokers who saw the provider type* in the last 12 months.

Table 3-11. Ask, Advise and Refer model services received by smokers who visited a provider in last 12 months, by type of provider visited

Service	Provider type				
	Any provider	Doctor	Nurse	Pharmacist	Dentist
	%	%	%	%	%
Ask	**86.5** ± 3.3	**89.3** ± 3.3	**73.9** ± 6.8	**5.5** ± 3.0	**54.7** ± 6.1
Advise	**74.0** ± 4.3	**75.6** ± 4.5	**56.3** ± 7.6	**4.3** ± 2.4	**39.2** ± 6.3
Refer	**40.3** ± 5.1	**43.3** ± 5.4	**26.4** ± 6.5	**5.0** ± 2.8	**6.1** ± 3.4

Source: Minnesota Adult Tobacco Survey, 2007

In the following sections, the analysis of smokers' experience with the Ask, Advise and Refer model is limited to those smokers who actually saw each provider type (Table 3-11). For each provider type, all the rows represent the same set of smokers, that is, those who saw that provider type.

Getting the Ask, Advise and Refer Model from Any Provider. Among smokers who saw at least one type of provider ("any provider") in the last 12 months, 86.5±3.3 percent of them were asked if they smoke and 74.0±4.3 percent were advised not to smoke. Fewer than half (40.3±5.1 percent) of current smokers, however, received a referral for assistance to quit smoking.

Ideally, all patients would report that their health care providers implement the clinical practice guideline. The currently high percentage of patients who report that providers Ask and Advise could still be improved. The lower rate for Refer

suggests that more providers need to implement this portion of the guideline more consistently.

Getting the Ask, Advise and Refer Model from Different Types of Providers. *Treating Tobacco Use and Dependence: 2008 Update* analyzed the body of research that examined the effectiveness of smoking cessation interventions provided by various types of clinicians. The analysis concluded that smoking cessation interventions delivered by any single type of health care provider or by multiple clinicians increase abstinence rates compared with interventions where no clinician is involved. Results are consistent across diverse clinician groups, with no clear advantage to any single clinician type.[20]

Doctors. This report examines Minnesota smokers' experiences with doctors in the context of smoking cessation in more detail than the other types of providers. While interest in the role that other providers play in smoking cessation has increased recently, medical doctors have been the focus because smokers are more likely to interact with and be influenced by doctors. Among smokers who saw a doctor in the last 12 months, 89.3±3.3 percent were asked by the doctor if they smoked and 75.6±4.5 percent were advised not to smoke (Table 3-11). Among those who visited a doctor, 43.3±5.4 percent received some form of referral to quitting assistance.

Minnesota smokers saw doctors more commonly than other types of providers in the last 12 months. Smokers reported receiving each service more often from a doctor than from other types of providers. Understanding the demographics of smokers who received these services from doctors may suggest how the model can be better and more uniformly implemented in all populations (Table 3-12). Because the sample sizes in each of the table cells become rather small when broken down into subgroups, the confidence intervals are fairly large in many of the cells in Table 3-12.

There is little difference among any of the demographic groups in the percentage of those who were asked by a doctor if they smoked and those who were advised not to smoke. None of the differences are statistically significant. Young adult smokers (18-24-year-olds) received a referral from a doctor at a much lower rate than other age groups, and the difference between them and those aged 45 and older is

statistically significant. There are no other significant differences for receiving a referral. Across all the services received from doctors, the widest ranges tended to occur across the age groups, while the gender and income groups tended to be tightly clustered.

Table 3-12. Ask, Advise and Refer model services received from doctors among smokers who visited a doctor in the last 12 months, by selected demographic characteristics

Characteristics	Asked	Advised	Referred
	%	%	%
Overall	**89.3** ± 3.3	**75.6** ± 4.5	**43.3** ± 5.4
Age			
18 to 24	**81.5** ± 14.8	**62.0** ± 15.7	**24.6** ± 11.5
25 to 44	**91.4** ± 4.9	**75.7** ± 7.5	**42.0** ± 9.9
45 to 64	**90.8** ± 3.5	**80.8** ± 5.3	**50.0** ± 7.5
65 or older	**82.8** ± 10.2	**72.8** ± 11.3	**50.5** ± 12.8
Gender			
Female	**92.8** ± 2.9	**77.4** ± 5.3	**42.0** ± 7.8
Male	**84.5** ± 6.4	**73.3** ± 7.4	**45.0** ± 7.4
Education			
Less than high school	**82.1** ± 16.3	**67.8** ± 18.2	**47.9** ± 21.5
High school graduate/GED	**93.3** ± 3.3	**80.2** ± 6.9	**46.3** ± 8.6
Some college or technical school	**87.5** ± 4.9	**73.5** ± 6.6	**41.0** ± 7.6
College graduate or beyond	**91.7** ± 4.6	**77.0** ± 9.0	**37.9** ± 11.7
Household income			
$35,000 or less	**87.7** ± 6.1	**73.7** ± 7.7	**44.1** ± 8.9
$35,001 to $50,000	**87.8** ± 7.7	**71.6** ± 12.8	**51.7** ± 16.3
$50,001 to $75,000	**94.0** ± 4.2	**74.0** ± 9.8	**37.2** ± 10.0
$75,001 or more	**91.5** ± 5.7	**81.7** ± 7.6	**44.1** ± 10.6

Source: Minnesota Adult Tobacco Survey, 2007

Nurses. Studies have shown that the nation's 3 million nurses—the largest group of clinicians in the country—are very effective in helping people stop smoking. Because of their sheer numbers and the public's trust in them, nurses are in a unique position to assist patients with smoking cessation.[21]

Among smokers who saw a nurse in the last 12 months, 73.9±6.8 percent were asked if they smoke, 56.3±7.6 percent were advised against smoking, and 26.4±6.5 percent received a referral to a stop-smoking program or use of medications.

Even with their low percentage of visits to nurses (30.5±4.0 percent, Figure 3-7), Minnesota smokers would likely benefit from a higher rate of referrals from nurses. Only 26.4±6.5 percent of smokers received referrals from nurses.

Pharmacists. There are some initiatives under way around the country to train and encourage pharmacists to play a role in smoking cessation. The pharmacist's role as dispenser of prescription quit aids reinforces this idea. While the personal interaction with their customers may put them in a good tactical position to play this role, pharmacists are not necessarily perceived as caregivers. The Ask, Advise and Refer model, which can be offered in as little as 30 seconds, transfers in-depth treatment responsibility to other providers and organizations.

Smokers had negligible experience with the Ask, Advise and Refer model from pharmacists, with rates far lower than from any other type of provider. Among Minnesota smokers who saw a pharmacist in the past year, approximately 5 percent were asked, advised or referred. Specifically, 5.5±3.0 percent were asked, 4.3±2.4 percent were advised, and 5.0±2.8 percent received a referral to a stop-smoking program or a medication recommendation from a pharmacist. Few pharmacists currently implement the Ask, Advise and Refer model with their customers.

Dentists. Given the natural occasion that dental treatment offers for addressing smoking cessation, combined with the higher encounter rate that smokers have with dentists than with nurses or pharmacists, interventions by dental clinicians could further reduce smoking.

Smokers experienced the second-lowest level of implementation of the Ask, Advise and Refer model from dentists. Among smokers who saw a dentist in the last 12 months, 54.7±6.1 percent were asked if they smoke and 39.2±6.3 percent were advised not to smoke. The rate of referral to stop-smoking programs or medications was 6.1±3.4 percent.

Around half of the smokers who saw dentists were asked if they smoke, compared with nearly three-quarters of those who encountered a nurse and nearly 90 percent of those who saw a doctor. Receiving advice to quit smoking was correspondingly lower for dental encounters than for encounters with nurses and doctors. In either

event, results make a case for engaging dental professionals in smoking cessation and educating them to intervene through the Ask, Advise and Refer model.

3.3.3 Forms of Referral Received by Smokers from Different Types of Providers

As noted, MATS identified three ways that providers could refer their patients who smoke to assistance with quitting: recommending stop-smoking medications, recommending behavioral counseling and actually providing assistance in gaining access to a behavioral counseling program, such as a stop-smoking telephone quitline.

Table 3-13 presents the percentage of smokers who received any form of referral from any type of provider. The first row, *Any Referral,* is identical to the *Refer* row in Table 3-11 and is included here for convenient reference. A provider may furnish more than one form of referral. In fact, behavioral counseling in combination with stop-smoking medications has been shown to be more effective than either in isolation. Of note, MATS does not seek to capture whether a doctor actually prescribed the medication that he or she suggested.

Table 3-13. Stop-smoking referrals received by smokers who visited a provider in the last 12 months, from each provider type, among all smokers who visited the provider type

Form of referral	Provider type				
	Any provider	Doctor	Nurse	Pharmacist	Dentist
	%	%	%	%	%
Any referral	**40.3** ± 5.1	**43.3** ± 5.4	**26.4** ± 6.5	**5.0** ± 2.8	**6.1** ± 3.4
Recommended medication	**31.2** ± 4.9	**33.7** ± 5.4	**16.9** ± 5.1	**3.9** ± 2.4	**3.5** ± 2.8
Suggested quit smoking program	**23.2** ± 4.7	**24.3** ± 5.3	**17.6** ± 5.7	**1.5** ± 1.5	**4.1** ± 2.2
Helped access quit smoking program	**12.1** ± 4.4	**12.7** ± 5.1	**6.8** ± 3.2	**0.8** ± 1.4	**0.8** ± 0.7

Source: Minnesota Adult Tobacco Survey, 2007

Overall, 31.2±4.9 percent of smokers who saw a provider received a recommendation for stop-smoking medication from a provider ("any provider") in the last 12 months. Nearly one quarter (23.2±4.7 percent) received a recommendation for a quit-smoking program; 12.1±4.4 percent got help accessing such a program.

Some patterns of receiving quitting referrals emerge by provider type. Smokers received medication recommendations at a higher rate from doctors than from nurses. Similarly, smokers received medication recommendations from doctors and nurses at higher rates than from pharmacists or dentists. Both of these comparisons are statistically significant.

The percentage of smokers receiving suggestions for a quit-smoking program did not differ significantly between doctors and nurses. Still, doctors and nurses referred patients to quit-smoking programs at higher levels, which are statistically significant, than pharmacists and dentists.

Among smokers who saw doctors and among those who saw nurses, 12.7±5.1 percent and 6.8±3.2 percent, respectively, were assisted in getting access to a quit-smoking program. The difference between doctors and nurses is not statistically significant. Almost no smokers received such program access from dentists or pharmacists; both are different and statistically significant when compared with doctors and nurses.

3.3.4 Quitting Assistance from Providers, 1999 to 2007

This section examines the extent to which various aspects of Minnesotans' experiences with their health care providers changed over the period from 1999 to 2007 with regard to identifying and treating cigarette smokers.

Visits to Providers by Smokers, 2003 to 2007

Almost no statistically significant changes in the percentages of smokers who saw the various health care providers in the last 12 months occurred between 1999 and 2007. The single exception is a significant decline in visits to pharmacists between 1999 and 2007 (Table 3-14).

Visit to Any Provider. The percentage of smokers who saw any provider remained fairly constant at about 80 percent from 1999 to 2007.

Visits to Multiple Providers. The percentage of smokers who visited multiple provider types also remained constant from 1999 to 2007 at about 60 percent.

Table 3-14. Visits to health care providers by current smokers, by provider type, from 1999 to 2007

Provider type	1999	2003	2007	Change over time	
				1999 to 2007	2003 to 2007
	%	%	%	%	%
Any provider type	**78.3** ± 3.6	**84.9** ± 3.7	**81.7** ± 3.7	**3.4** ± 5.2	**-3.2** ± 5.3
Two or more provider types	**62.4** ± 4.2	**60.9** ± 4.6	**60.2** ± 4.7	**-2.2** ± 6.3	**-0.6** ± 6.6
Medical doctor	**65.1** ± 4.1	**64.1** ± 4.7	**68.5** ± 4.5	**3.4** ± 6.1	**4.5** ± 6.5
Nurse	**26.6** ± 3.9	**33.7** ± 3.8	**30.5** ± 4.0	**3.9** ± 5.6	**-3.2** ± 5.6
Pharmacist	**54.0** ± 4.4	**48.0** ± 4.4	**42.2** ± 4.6	**-11.9** ± 6.3 *	**-5.8** ± 6.3
Dentist	**51.7** ± 4.4	**53.0** ± 4.4	**49.6** ± 4.6	**-2.1** ± 6.4	**-3.4** ± 6.4

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 1999, 2003 and 2007

Visit to Specific Types of Providers. The percentage of smokers visiting doctors, dentists and nurses remained constant between 1999 and 2007, and between 2003 and 2007. The percentage of smokers who saw a pharmacist, declined by 11.9±6.3 points from 1999 to 2007, a statistically significant drop.

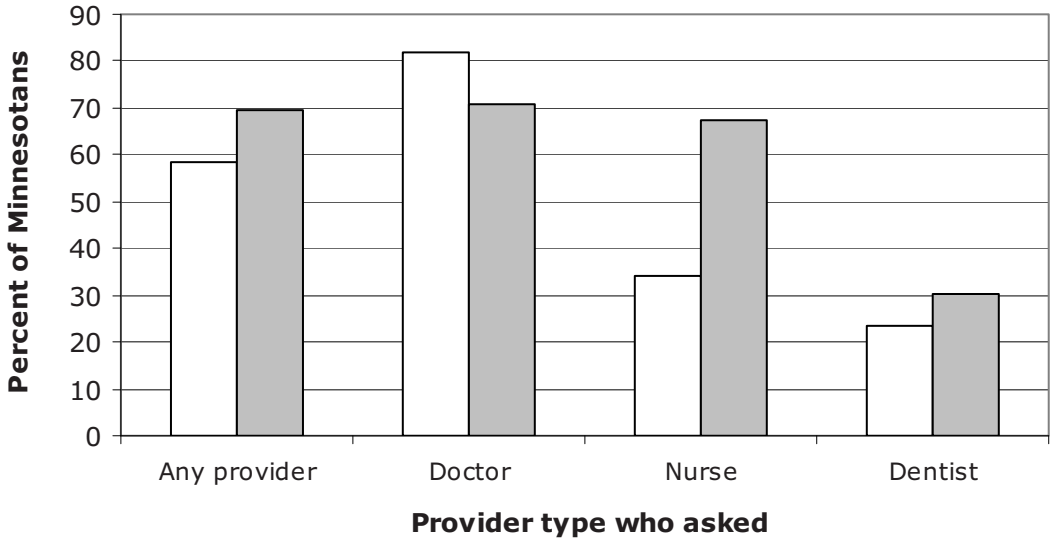
Interventions with Smokers: Ask, Advise and Refer Model, 2003 to 2007

This section examines the change over time in the extent to which Minnesota smokers experienced the Ask, Advise and Refer model, whether from any provider type or from specific provider types. There was a change in the wording of the questions about how health care providers implemented the Ask, Advise and Refer model in the 2007 survey, so the information was not collected in the same way in 2003 and 2007. The results of the comparisons over time should be interpreted with some caution, but the differences in wording of the questions likely had a small effect on MATS results.

As in the comparable section for MATS 2007, the percentages of smokers are based on smokers who saw the provider type in question. Before focusing on smokers specifically, this section looks at change from 2003 to 2007 in the percent of all Minnesotans who were asked if they smoke.

Ask. Figure 3-8 shows distinct and significant changes in the percentage of Minnesotans who were asked by providers if they smoked. For those who saw any

Figure 3-8. Minnesotans who were asked by health care providers in the last 12 months if they smoked, by provider type, from 2003 to 2007



Year	Any provider	Doctor	Nurse	Dentist
2003	58.5 ± 1.8	81.8 ± 2.0	34.2 ± 2.5	23.6 ± 2.2
2007	69.4 ± 1.5	70.6 ± 1.5	67.6 ± 2.4	30.2 ± 1.8
Change over time 2003 to 2007	10.9 ± 2.4 %*	-11.2 ± 2.5 %*	33.4 ± 3.5 %*	6.7 ± 2.8 %*

*Statistically significant at the 95% confidence level

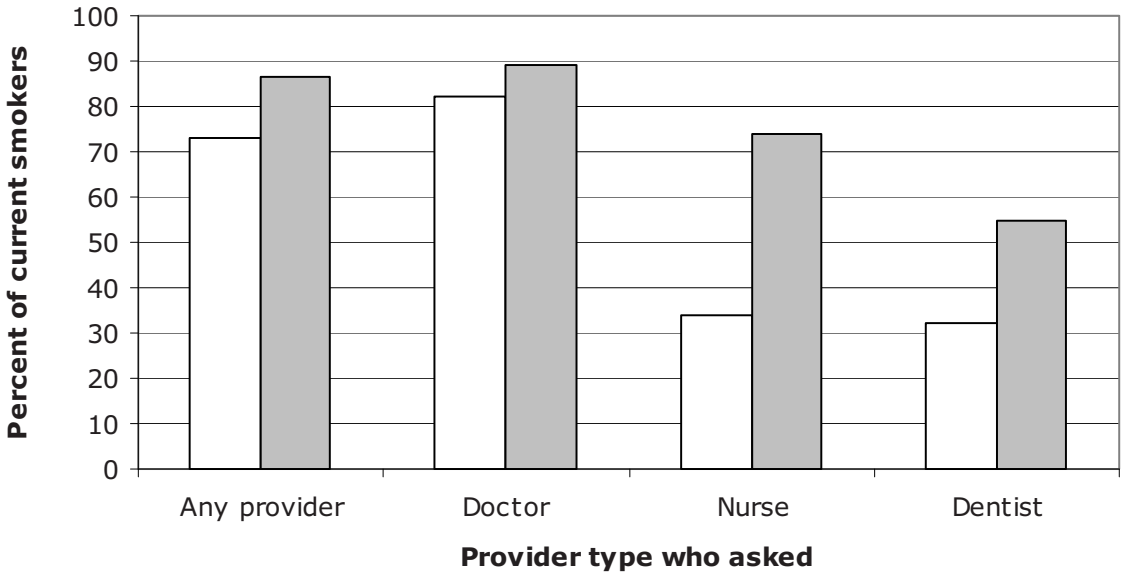
Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

type of provider, the percentage increased considerably, by 10.9±2.4 percentage points, from 58.5±1.8 percent in 2003 to 69.4±1.5 percent in 2007. There are two countervailing patterns among specific provider types seen. While the percentage of those asked by a doctor declined by 11.1±2.5 points, the percentage asked by a nurse increased by 33.4±3.5 points. By 2007, the percentages asked by each of these two types of providers both increased to the same level, with 70.6±1.5 percent being asked by a doctor and 67.6±2.4 percent being asked by a nurse. The size of this increase might be explained by the explicit outreach of Minnesota's tobacco control program to the entire clinic team, including nurses, educating them about their potential role in smoking cessation and encouraging them to adopt the Ask, Advise and Refer protocol. The percentage of Minnesotans asked by dentists increased by

6.7±2.8 percentage points between 2003 (23.6±2.2 percent) and 2007 (30.2±1.8 percent). All of the changes discussed in this paragraph are statistically significant.

Figure 3-9 shows the same information as Figure 3-8, but specifically for smokers who had seen a provider in the last 12 months. With the exception of being asked by doctors, the trend for smokers parallels that for the overall population. Among smokers who saw any type of provider, the percentage who were asked if they smoke increased by 13.6±5.6 points from 2003 to 2007. Unlike the overall population, the percentage of smokers who were asked by doctors increased by 6.9±4.9 points, to 89.3±3.3 percent. The fact that the 2007 percentage for smokers is much larger than for the overall population (70.6±1.5 points, Figure 3-8) and that it increased since 2003 for smokers but decreased in the overall population suggests that doctors may be monitoring their smoking patients closely and may really be asking them, in effect, if they are still smoking. The large increase in those asked by nurses found for the overall population appears also among smokers, rising by 39.9±8.1 points to 73.9±6.8 percent in 2007, more than doubling the percentage over the four-year period. The approximate 7-point increase found among the general population for being asked by a dentist expands threefold among smokers, to an increase of 22.3±7.6 points, with the result that 54.7±6.1 percent of smokers were asked by a dentist in 2007, compared with about one-third four years earlier. All of the changes discussed in this paragraph are statistically significant.

Figure 3-9. Current smokers who were asked by health care providers in the last 12 months if they smoked, by provider type, from 2003 to 2007



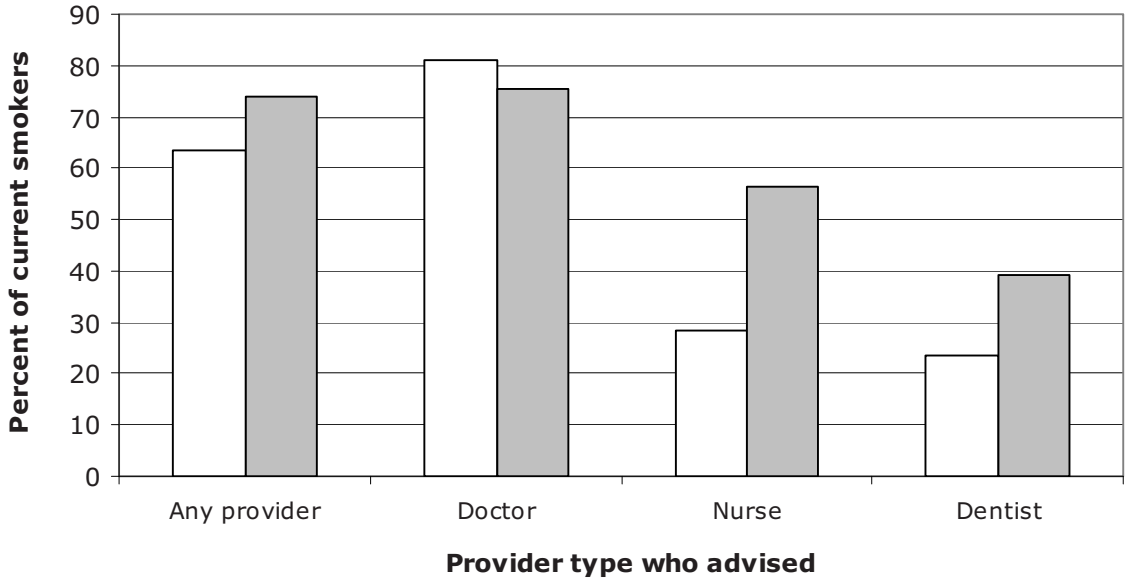
Year	Any provider	Doctor	Nurse	Dentist
2003	72.9 ± 4.6	82.4 ± 3.6	34.0 ± 4.5	32.4 ± 4.6
2007	86.5 ± 3.3	89.3 ± 3.3	73.9 ± 6.8	54.7 ± 6.1
Change over time 2003 to 2007	13.6 ± 5.6 %*	6.9 ± 4.9 %*	39.9 ± 8.1 %*	22.3 ± 7.6 %*

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

Advise. The trend for the percentages of smokers who were advised by a provider not to smoke is similar to that for smokers being asked, except with regard to doctors (Figure 3-10). Among smokers who saw any type of provider, the percentage who were advised not to smoke increased by 10.4±6.3 percentage points from 2003 to 2007. The percentage of smokers who were advised by doctors not to smoke decreased by 5.4±6.0 points, to 75.6±4.5 percent; this is compared with the approximate 7-point increase in smokers being asked by doctors about smoking. The large increase in smokers asked by nurses carried over into a similarly large increase of 27.8±9.2 percentage points in smokers who were advised by nurses not

Figure 3-10. Current smokers who were advised not to smoke by health care providers in the last 12 months, by provider type, from 2003 to 2007



Year	Any provider	Doctor	Nurse	Dentist
2003	63.6 ± 4.7	81.1 ± 4.0	28.5 ± 5.1	23.4 ± 4.9
2007	74.0 ± 4.3	75.6 ± 4.5	56.3 ± 7.6	39.2 ± 6.3
Change over time 2003 to 2007	10.4 ± 6.3 %*	-5.4 ± 6.0 %	27.8 ± 9.2 %*	15.9 ± 8.0 %*

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

to smoke, rising to 56.3±7.6 percent of smokers in 2007. The increase found for smokers being asked by dentists (22.3±7.6 points) persisted in the form of a smaller but still noteworthy increase of 15.9±8.0 points in smokers being advised by dentists not to smoke. All of the changes discussed in this paragraph are statistically significant except for the decline in being advised by a doctor not to smoke.

MATS collected various data about referring smokers to quit-smoking programs in both 2003 and 2007, but the items were too different to validly compare the two time points for this concept; therefore, the comparison over time is not discussed in this report.

3.4 Smoke-free Policies and Quitting

This section examines the policy changes in Minnesota that may encourage attempting and maintaining a sustained quit. These include efforts to encourage smoke-free workplace policies, and the passage of ordinances that regulate secondhand smoke. Smoke-free worksite policies have been strongly associated with reduced cigarettes smoked per day and increased quit attempts.[22]

At the time of MATS 2007 data collection not all worksites in Minnesota were covered by smoke-free policies. In 1975, Minnesota became the first state to restrict smoking in indoor workplaces through the Minnesota Clean Indoor Air Act (MCIAA). The Act primarily covered offices and retail stores. In 2003, factories and warehouses were added with provisions for smoking rooms. At the time of MATS 2007, however, the MCIAA did not apply to bars and restaurants. Hospitality worksites could voluntarily restrict smoking.

Community ordinances enacted at the local level extend smoke-free policies to include bars and restaurants. These local policies not only protect non-smoking patrons and employees from exposure to secondhand smoke but also provide a supportive environment for patrons and employees who smoke but want to quit. These public policies may also de-normalize smoking so fewer Minnesotans will start smoking. A California study focused on worksite ordinances found that smokers employed in local communities with strong smoke-free policies were more likely to quit over a six-month period than those in communities without such policies. The stronger the policy, the more likely workers were to quit smoking.[23]

Beginning in 2000, Minnesota cities and counties began to pass smoke-free workplace ordinances. These community ordinances varied in strength, particularly as to whether they included bars as well as restaurants. In May 2007, the Minnesota Legislature passed the Freedom to Breathe Act of 2007, a comprehensive smoke-free law covering indoor public places and workplaces, including bars and restaurants. Because the law went into effect in October 2007, after the MATS 2007 data collection period, MATS 2007 cannot describe the effect of this statewide law on quitting. However, MATS 2007 can compare communities with and without smoke-free policies at the time of data collection to describe the effect of local policies on

quitting, providing some basis for predicting the future, potentially larger, effect of the statewide law.

In addition to smoke-free workplace policies, voluntary restrictions on smoking in the home can support smokers in their attempts to quit. Beyond protecting adult nonsmokers and children from the health hazards of secondhand smoke exposure, home smoking restrictions reduce cues to smoke and make the behavior less acceptable. Smokers with restrictions on smoking in the home tend to smoke fewer cigarettes per day, attempt to quit more often and quit for longer periods than smokers who do not have restrictions on smoking in their home.[24]

Smoke-free workplace policies and voluntary home restrictions in Minnesota and the association of such restrictions with secondhand smoke exposure are discussed in chapter 4. This section focuses on the association of these restrictive smoking policies with quitting attempts. As used in this report, the term "smoking policies" or "smoke-free policies" refers generally to public laws and codes, private rules established by owners or operators of workplaces or publicly accessible locations, and household rules and practices established in private homes by home owners and residents.

3.4.1 Community Smoke-free Policies and Quitting

Community Smoke-free Policies

MATS obtained information about smoke-free policies regarding smoking in bars and restaurants in two ways.

Survey Question

The first way was to ask respondents the following question:

- Is there a ban on smoking in bars and restaurants in your area?

This question reveals people's perception of whether there is a formal, legal ban in their community, independent of whether there really is such a ban. The term "area" was deliberately adopted to find out whether people felt there is a policy affecting their lifestyle, even if it is not in the formal jurisdiction in which they live.

The second way was to obtain each respondent's county of residence and ZIP code to determine if the person actually resided in a Minnesota county or other local jurisdiction where a legal ban on smoking in bars and restaurants had actually been enacted by the time of MATS 2007.

At the time data were being collected for MATS 2007, there were 15 Minnesota cities and counties that had smoke-free ordinances for restaurants and bars (see Table 3-15). ZIP codes were used to identify MATS 2007 respondents who lived in a community or county with such an ordinance. These clean indoor air ordinances covered 38.1±1.5 percent of Minnesotans, as estimated from the survey. There are no differences in coverage by age, gender, education, income or smoking status.

However, 59.1±1.6 percent of Minnesotans in 2007 said their community was covered by a smoke-free ordinance that did not allow smoking in restaurants and bars. There are no differences in the perceived existence of such an ordinance by age, gender, education, income or smoking status. The discrepancy between actual and perceived clean indoor air coverage is likely due to false reports of ordinances by people who live near the boundaries of a city or county with a clean indoor air ordinance or by those who assume such a policy is in place, perhaps because of news coverage of the general topic. The first factor, if real, would suggest that the effect of a clean indoor air ordinance may spread beyond the boundaries of the city

or county in which it was passed and enacted. This finding may also reflect the differences between communities where Minnesotans live and those where they work and visit. Many Minnesotans living in the Twin Cities metro area might have been living in a community without a smoke-free policy, but working and going out to eat in a nearby community that did have a smoke-free policy. Therefore, when asked about a policy "in their area," respondents might have thought more broadly than just their ZIP code area.

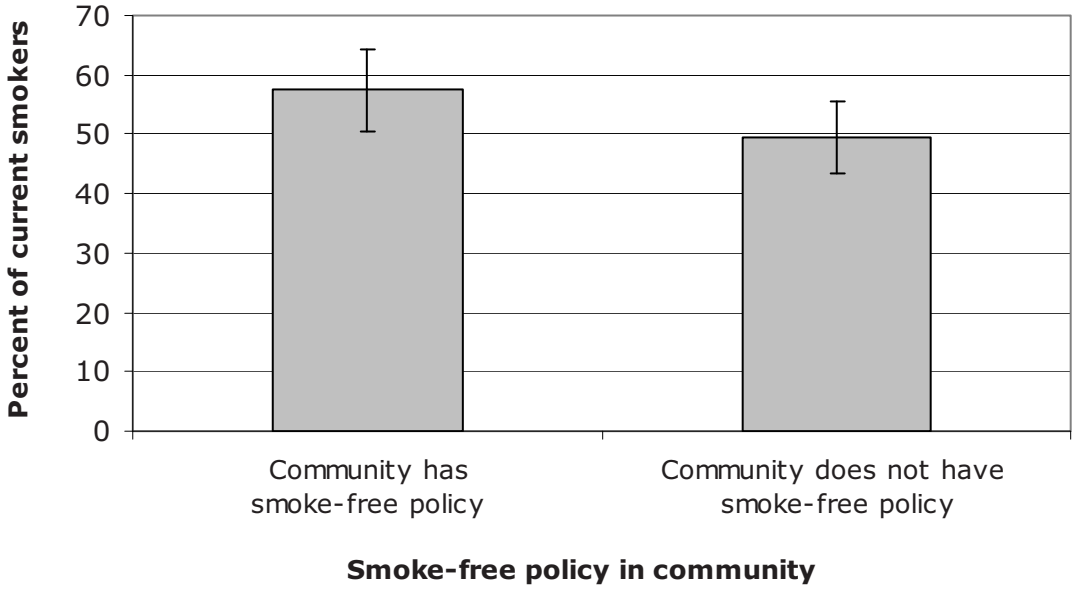
Table 3-15. Minnesota cities and counties with smoke-free ordinances as of Dec. 31, 2006

Cities	Counties
Bloomington Cloquet Duluth Golden Valley International Falls Mankato Minneapolis Moorhead Moose Lake St. Paul	Beltrami Hennepin McLeod Olmsted Ramsey

Among those who believed there was a smoke-free ordinance in their community, 58.5±2.2 percent did live in a community with an ordinance, as determined geographically. However, among those who did not believe there was an ordinance in their community, 89.6±2.0 percent did not live in a community with an ordinance, as determined geographically.

Community policies as geographically determined by ZIP code do not appear to be associated with attempts to quit. Among smokers with a smoke-free ordinance covering restaurants and bars in their community (as determined by ZIP code), 57.4±6.8 percent tried to quit smoking in the past 12 months (Figure 3-11). This is not statistically different from the 49.4±6.1 percent of smokers who did not have a smoke-free restaurant and bar ordinance in their community.

Figure 3-11. Current smokers who made a quit attempt in the past 12 months, by the presence or absence of a smoke-free policy in their community (geographically determined)



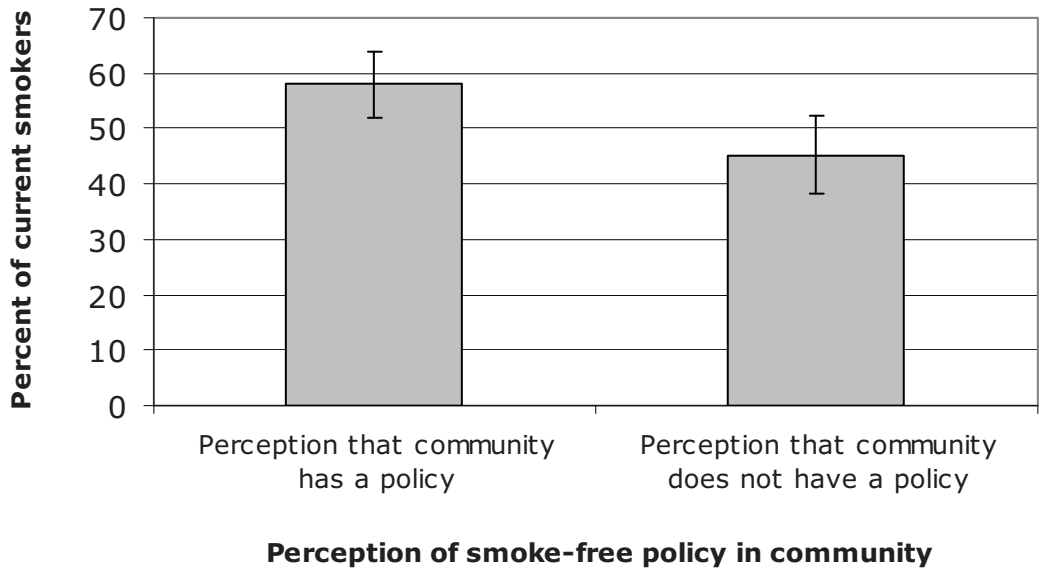
	Community has smoke-free policy	Community does not have smoke-free policy
Percent of current smokers	57.4 ± 6.8	49.4 ± 6.1

Source: Minnesota Adult Tobacco Survey, 2007

However, there may be an association between the perception of a smoke-free ordinance in their area and quit attempts. Among current smokers who believe there is a smoke-free ordinance in their area, 57.9±6.1 percent tried to quit smoking in the past 12 months (Figure 3-12). In contrast, among current smokers who do not believe there is a smoke-free ordinance in their area, only 45.2±7.1 percent tried to quit smoking in the past 12 months. This difference is statistically significant ($p<0.05$). As mentioned above, the discrepancy between geographically determined and perceived ordinances included those who actually live in a community with a smoke-free ordinance, but believe they do not, and those who live in an area without a smoke-free ordinance, but believe that they do. This finding suggests that internal perception of a smoke-free ordinance for bars and restaurants has a

stronger relationship to quit attempts than the objective existence of such an ordinance. Further research is needed to understand this relationship.

Figure 3-12. Current smokers who made a quit attempt in the past 12 months, by the perceived presence or absence of a smoke-free policy in their community



	Perception that community has a policy	Perception that community does not have a policy
Percent of current smokers	57.9 ± 6.1	45.2 ± 7.1

Source: Minnesota Adult Tobacco Survey, 2007

3.4.2 Workplace Smoke-free Policies and Quitting

Workplace Smoke-free Policies

MATS collects information about the smoking policies at Minnesotans' workplaces. All analyses of workplace policies are limited to Minnesotans who are employed.

Survey Questions

- Which of the following best describes your place of work's official smoking policy for work areas? Smoking is…not allowed in any work areas, allowed in some work areas, allowed in all work areas, or there is no official smoking policy?
- Which of the following best describes your place of work's official smoking policy for indoor public or common areas, such as lobbies, rest rooms and lunchrooms? Smoking is…not allowed in any common areas, allowed in some common areas, allowed in all common areas, or there is no official smoking policy?
- At your workplace, is smoking allowed anywhere on the property outside the building?

MATS defines a smoke-free workplace by a combination of the first two questions. If the responses to both questions are that smoking is not allowed, this is construed to mean that smoking is not allowed in most areas.

The definition excludes people who work in their own homes from analyses of workplace smoking policies. Working at home is determined by the following question:

- What best describes where you work for money? Would you say it is a classroom, a hospital, an office, your home, other people's homes, a plant or factory, a store or warehouse, a restaurant that does not serve alcohol, a restaurant that serves alcohol, a bar, a vehicle, or some other setting?

Analysis of workplace policies is conducted separately for those working primarily in an indoor or outdoor setting using the following survey question:

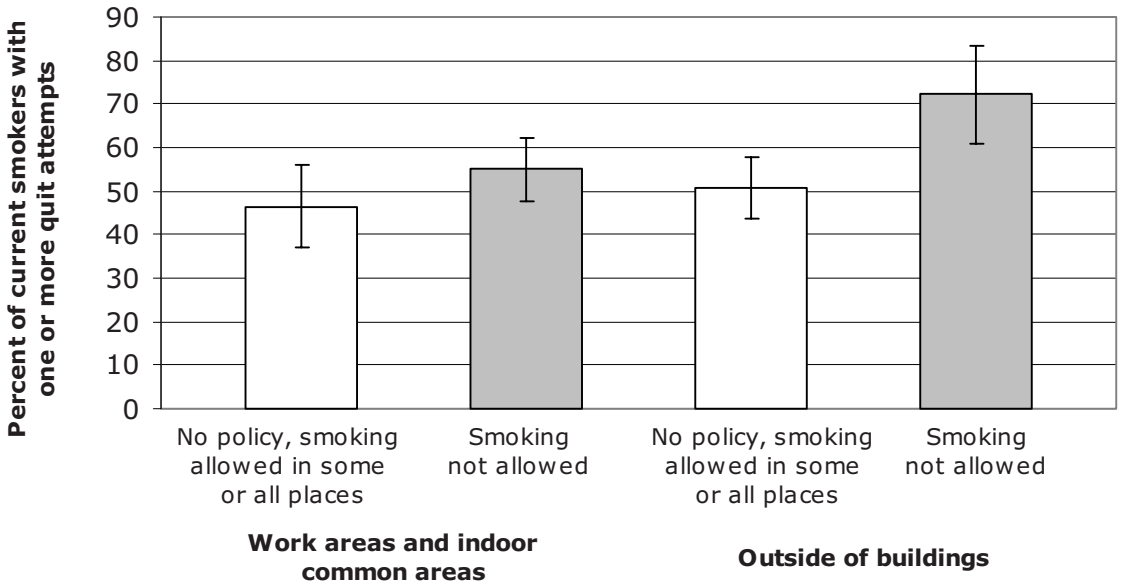
- While working at your job, are you indoors most of the time?

Over three-quarters (76.1±1.9 percent) of Minnesotans who are employed report that smoking is not allowed in areas or indoor common areas of their workplace. Over three-quarters of never smokers (77.7±2.5 percent) and former smokers (78.4±3.4 percent) say that smoking is not allowed in work areas or indoor common areas, compared with 68.0±5.3 percent of current smokers.

Among smokers who work where smoking is allowed in neither work areas nor indoor common areas, 55.0±7.3 percent have tried to quit in the past year (Figure 3-13). In comparison, among smokers who work where smoking is allowed at some times or in some places in work areas or indoor common areas, 46.5±9.4 percent have tried to quit in the past year. This difference is not statistically significant.

MATS 2007 provides stronger evidence that smoke-free policies anywhere on the property outside the buildings might encourage quitting. Among smokers who work where smoking is not allowed outside the buildings, 72.2±11.4 percent have tried to quit smoking in the past year compared with 50.7±7.0 percent of smokers who have tried to quit smoking in the past 12 months among those who work where smoking is allowed outside the buildings. This is a statistically significant difference. Outside areas have been the last space where people who work at locations with indoor smoke-free policies are able to smoke.

Figure 3-13. Current smokers with one or more quit attempts in the past 12 months, by various workplace smoke-free policies



	Work areas and indoor common areas		Outside of buildings	
	No policy, smoking allowed in some or all places	Smoking not allowed	No policy, smoking allowed in some or all places	Smoking not allowed
Percent of current smokers with one or more quit attempts	46.5 ± 9.4	55.0 ± 7.3	50.7 ± 7.0	72.2 ± 11.4

Source: Minnesota Adult Tobacco Survey, 2007

3.4.3 Home Smoke-free Rules and Quitting

Home Smoke-free Rules

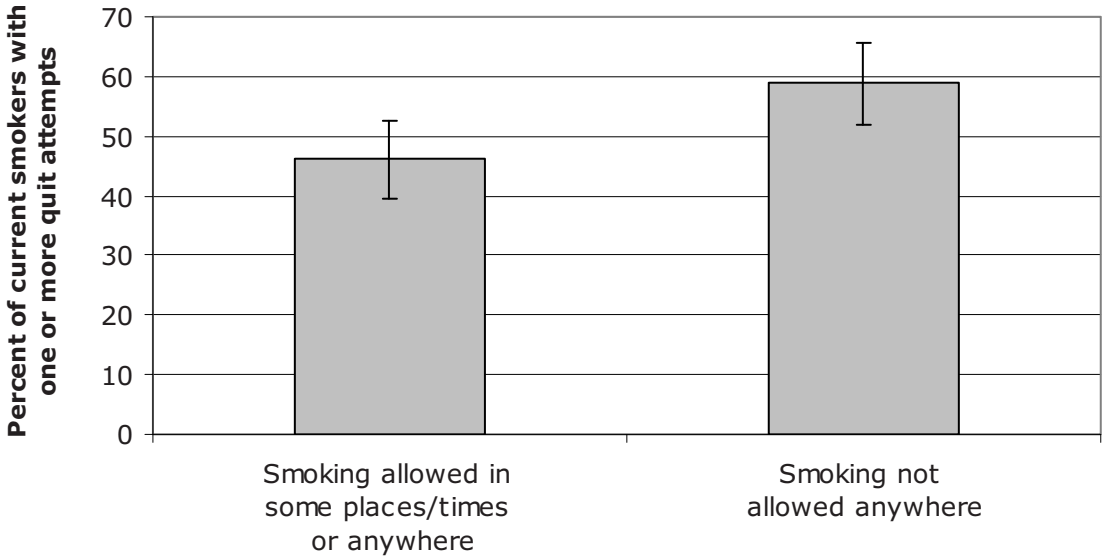
Survey Question

- 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, smoking is allowed in some places or at some times, or smoking is allowed anywhere inside the home?

Over 80 percent (83.2±1.3 percent) of Minnesotans live in homes where smoking is not allowed anywhere. Not unexpectedly, never-smokers (92.1±1.3 percent) are the most likely to live in homes with smoke-free policies, followed by former smokers (85.6±1.8 percent) and current smokers (49.6±4.6 percent). These differences among smoking status groups are statistically significant. Notably, half of all smokers live in homes where smoking is not allowed.

About 60 percent (58.8±6.8 percent) of smokers with smoke-free policies in their home tried to quit smoking in the past year, compared with 46.1±6.5 percent of those who do not have smoke-free policies at home (Figure 3-14). This association is statistically significant ($p<0.05$).

Figure 3-14. Current smokers with one or more quit attempts in the past 12 months, by smoke-free rule inside the home



	Smoking allowed in some places/times or anywhere	Smoking not allowed anywhere
Percent of current smokers with one or more quit attempts	46.1 ± 6.5	58.8 ± 6.8

Source: Minnesota Adult Tobacco Survey, 2007

3.4.4 Perceived Effect of Smoke-free Policies on Quitting Attitudes and Behaviors

Perceived Effect of Smoking Restrictions

Survey Questions

- What effects, if any, {did/do} smoking restrictions at work, home, restaurants, bars, or elsewhere have on your smoking? Would you say smoking restrictions…

  {Helped/Help} you think about quitting?

  {Helped/Help} you to cut down on cigarettes?

  {Helped/Help} you make a quit attempt?

  {Helped/Help} you maintain a quit?

The past-tense wording was used with former smokers, and the present tense wording was used with current smokers.

The self-reported effect of smoking restrictions is summarized in Table 3-16. Since educational, outreach and legislative efforts to promote smoke-free policies are somewhat recent, MATS uses former smokers who have quit in the past five years to approximate the group of former smokers likely to have been affected. Current and former smokers are combined for this analysis to present a complete picture of the effect of the policy on people who were smoking during the period when such policies were in effect.

It appears that current smokers and former smokers who have quit in the past five years are encouraged to think about quitting or cutting down by public and private policies that restrict secondhand smoke exposure. Over one-third (36.2±3.7 percent) of current smokers and former smokers who have quit in the past five years say that smoke-free policies have made them think about quitting. In addition, 55.7±4.6 percent of current smokers say that smoke-free policies have made them cut down on cigarettes, and 36.9±5.6 percent of former smokers who have quit in the past five years say that smoke-free policies made them cut down before quitting.

Table 3-16. Smoking-related reactions to restrictions on smoking (at home, at work, in restaurants and bars or elsewhere) among current smokers and former smokers (who quit within the past five years)

Smoking status	Reactions			
	Thought about quitting	Cut down on cigarettes	Made a quit attempt	Maintained a quit attempt
	%	%	%	%
Overall	**36.2** ± 3.7	**51.5** ± 3.9	**28.38** ± 3.5	**24.6** ± 3.0
Current smokers	**36.9** ± 4.4	**55.7** ± 4.6	**28.13** ± 4.3	**19.9** ± 3.3
Former smokers	**33.9** ± 5.5	**36.9** ± 5.6	**29.26** ± 5.2	**40.6** ± 6.0

Source: Minnesota Adult Tobacco Survey, 2007

Current smokers and former smokers who have quit in the past five years also seem more likely to try to quit or maintain a quit when smoking is restricted. About 28 percent of this group said that restrictions on smoking helped them make a quit attempt. There are no statistically significant differences between current and former smokers.

Combined, 24.6±3.0 percent of current smokers and former smokers who have quit in the past five years said that restrictions on smoking helped them maintain a quit. Taken separately, 19.9±3.3 percent of the current smokers said that such restrictions helped them maintain a quit (although they must have relapsed since they are now current smokers), while 40.6±5.6 percent of the former smokers did so.

3.5 Raising the Cost of Tobacco Products and Quitting

Raising the cost of tobacco products encourages smokers to quit. Higher tobacco costs not only keep youth from starting to smoke, but also encourage adults to quit smoking—a fact demonstrated by public health experts and well known by the tobacco industry.[25] This structural policy approach reduces the demand for cigarettes and ultimately shifts social norms by discouraging smoking. For this reason, increasing the cost of tobacco products through excise taxes and similar measures remains a critical policy component of a comprehensive tobacco control program. Effective Aug. 1, 2005, Minnesota implemented a health impact fee, which raised the cost of tobacco products.

Effect of Cost Increase on Quitting and Locations of Cigarette Purchase

Survey Questions

- In August 2005, a 75-cent cigarette tax increase took effect in Minnesota. What effects, if any, did this price increase have on your smoking? Did it…

  Help you think about quitting?

  Help you to cut down on cigarettes?

  Help you make a quit attempt?

  Help you maintain a quit?

- Do you usually buy your cigarettes…in Minnesota, out of state, over the Internet, through mail order, or an 800 number?

For MATS 2007, current smokers and former smokers who last smoked regularly within the past two years are combined to examine the full response to the cost increase that took effect in August 2005.

Minnesota's current smokers and former smokers who were still smoking at the time of the cost increase did respond to it. Overall, 42.7±4.1 percent of current smokers and former smokers who have quit in the past two years thought about quitting as a result of the cost increase, 29.4±3.7 percent cut down on cigarettes and 27.1±4.0 percent attempted to quit as a result of the cost increase (Table 3-17). There were no statistically significant differences in thinking about quitting, cutting down or attempting to quit between current and former smokers.

Table 3-17. Smoking-related reactions to the 2005 tobacco cost increase among current and former smokers (who quit within the last two years), by selected demographic characteristics and smoking status

Characteristics	Reactions			
	Thought about quitting	Cut down on cigarettes	Made a quit attempt	Maintained a quit attempt
	%	%	%	%
Overall	**42.7** ± 4.1	**29.4** ± 3.7	**27.1** ± 4.0	**9.8** ± 2.3
Age				
18 to 24	**41.2** ± 10.9	**28.1** ± 10.3	**32.4** ± 10.8	**17.5** ± 10.1
25 to 44	**40.9** ± 7.1	**26.3** ± 6.2	**26.5** ± 7.1	**6.3** ± 3.0
45 to 64	**46.3** ± 5.9	**32.4** ± 5.4	**26.6** ± 4.9	**10.4** ± 2.9
65 or older	**38.2** ± 9.3	**37.0** ± 9.1	**20.5** ± 6.5	**12.0** ± 4.6
Gender				
Female	**42.8** ± 5.7	**31.0** ± 5.1	**26.5** ± 5.8	**10.5** ± 3.1
Male	**42.5** ± 5.9	**28.0** ± 5.3	**27.6** ± 5.4	**9.2** ± 3.5
Education				
Less than high school	**41.4** ± 14.1	**33.8** ± 13.1	**39.9** ± 16.7	**15.2** ± 10.5
High school graduate/GED	**46.7** ± 7.0	**29.9** ± 6.3	**26.4** ± 6.0	**8.1** ± 2.4
Some college or technical school	**40.4** ± 5.8	**29.1** ± 5.5	**24.3** ± 5.0	**9.1** ± 3.5
College graduate or beyond	**37.4** ± 9.8	**23.8** ± 9.6	**24.3** ± 10.1	**12.3** ± 9.8
Household income				
$35,000 or less	**48.0** ± 6.7	**38.0** ± 6.4	**28.4** ± 5.5	**13.1** ± 4.3
$35,001 to $50,000	**39.4** ± 10.2	**27.0** ± 8.8	**31.2** ± 12.4	**11.6** ± 7.2
$50,001 to $75,000	**40.7** ± 8.9	**21.0** ± 6.0	**24.3** ± 6.9	**7.6** ± 3.7
$75,001 or more	**37.5** ± 8.2	**22.6** ± 7.2	**21.1** ± 6.6	**6.1** ± 2.6
Smoking status				
Current smokers	**43.4** ± 4.6	**29.4** ± 4.1	**26.3** ± 4.4	**6.0** ± 2.1
Former smokers	**39.0** ± 8.4	**29.0** ± 8.4	**31.1** ± 8.3	**29.8** ± 8.2

Source: Minnesota Adult Tobacco Survey, 2007

Nearly 10 percent (9.8±2.3 percent) of current and former smokers maintained a quit attempt as a result of the cost increase. There was a large and statistically significant difference between current and former smokers, with 6.0±2.1 percent of current smokers saying they maintained a quit attempt, and 29.8±8.2 percent of former smokers saying they maintained a quit attempt as a result of the cost increase. Because former smokers have quit and the current smokers have not, this finding is to be expected.

Nearly all current smokers (94.4±2.4 percent) get their cigarettes in Minnesota. Only 5.3±2.4 percent get their cigarettes out of state and less than 1 percent get their cigarettes by Internet, mail order or an 800 number. The data demonstrate that fears that smokers might buy their cigarettes from sources outside the state as a result of the 2005 cost increase were unfounded.

3.6 Key Findings

Some of the most important findings from this chapter are summarized below. All differences presented in this summary are statistically significant at the 0.05 confidence level unless otherwise noted.

Key Quitting Behavior Findings for 2007

- Over half (52.4±4.6 percent) of current smokers in Minnesota attempted to quit in the past 12 months; over two-thirds of these current smokers made multiple attempts.
- Nearly 10 percent (9.8±2.1 percent) of past-year smokers were quit as of the time of the survey.
- Nearly half (45.5±6.1 percent) of current smokers with a quit attempt in the past 12 months used some kind of stop-smoking medication on their last quit attempt, with young adults and those with less than a high school education showing the lowest rates of use.
- Smokers who tried to quit in the past 12 months used NRT at more than twice the rate of prescription medications (38.7±5.8 percent, compared with 15.4±4.0 percent).
- Among smokers who tried to quit in the past 12 months, 72.6±5.8 percent believe stop-smoking medications are too expensive. Among those who did use such medication, 55.7±5.6 percent received payment assistance.
- Overall, 14.9±4.0 percent of current smokers with a quit attempt in the past 12 months used some kind of behavioral quit-smoking counseling. The most common form of behavioral counseling was one-on-one counseling from a health professional, used by 9.8±3.2 percent.
- Among current smokers, 70.7±4.3 percent would use some form of assistance (medication or behavioral) in order to quit if cost were not an issue.
- Among the 81.7±3.7 percent of smokers who saw a health care provider in the last 12 months, 86.5±3.3 percent were asked by a provider if they smoked, 74.0±4.3 percent were advised not to smoke, and 40.3±5.1 percent received a referral to a stop-smoking program or medication.

- Among the approximately 68.5±4.5 percent of smokers who saw a doctor in the last 12 months, 89.3±3.3 percent were asked by a doctor if they smoked, 75.6±4.5 percent were advised not to smoke, and 43.3±5.4 percent received a referral to a stop-smoking program or medication. Young adults appear less likely to receive a referral from a doctor.

- Among the 30.5±4.0 percent of smokers who saw a nurse in the last 12 months, 73.9±6.8 percent were asked by a nurse if they smoke, 56.3±7.6 percent were advised against smoking, and 26.4±6.5 percent received a referral to a stop-smoking program or use of medications.

- Slightly less than 70 percent of smokers (68.0±5.3 percent) work where smoking is not allowed in work areas or indoor common areas; among these smokers, 55.0±7.3 percent tried to quit in the past year. About half (49.6±4.6 percent) of smokers live in homes where smoking is not allowed anywhere; among these smokers, 58.8±3.7 percent tried to quit in the past year.

- Living in homes with smoke-free policies and working where smoking is not allowed outside the building are both associated with smokers making a quit attempt in the past 12 months.

- Among current smokers, 51.5±3.7 percent reacted to restrictions on smoking in various settings by cutting down on cigarettes and 24.6±3.0 percent made a quit attempt and maintained it for some period of time.

- In 2005, Minnesota implemented a fee that increased the cost of cigarettes by 75 cents per pack. Overall, 42.7±4.1 percent of current smokers and former smokers who have quit in the past two years thought about quitting as a result of the cost increase, 29.4±3.7 percent cut down on cigarettes and 27.1±4.0 percent attempted to quit as a result of the cost increase.

- Nearly 10 percent (9.8±2.3 percent) of current and former smokers maintained a quit attempt as a result of the 2005 cost increase.

Key Quitting Behavior Trend Findings for 1999 to 2007

- The percentage of current smokers making a quit attempt in the past 12 months increased slightly between 1999 (46.3±4.4 percent) and 2007 (52.4±4.6 percent). This increase is not statistically significant.
- Between 1999 and 2007, the percentage of current smokers with a quit attempt in the past 12 months who used some kind of stop-smoking medication in their most recent quit attempt increased by 10.9±9.0 percentage points, from 34.6±6.7 percent to 45.5±6.1 percent.
- Between 2003 and 2007, the percentage of current smokers with a quit attempt in the past 12 months who used behavioral smoking cessation counseling increased by 11.3±4.4 percentage points from 3.6±1.8 percent to 14.9±4.0 percent.
- Among smokers who saw a health care provider in the past 12 months, there was an increase of 13.6±5.6 percentage points between 2003 and 2007 in the percentage who were asked if they smoke, and an increase of 10.4±6.3 percentage points in the percentage advised not to smoke.
- Among smokers who saw a doctor in the past 12 months, there was an increase of 6.9±4.9 percentage points between 2003 and 2007 in the percentage asked if they smoke. There was no statistically significant change in the percentage advised not to smoke.
- Among smokers who saw a nurse in the past 12 months, there were increases between 2003 and 2007 of 39.9±8.1 percentage points in the percentage asked if they smoke and 27.8±9.2 percentage points in the percentage advised not to smoke.

3.7 Discussion

Key components of successfully reducing the prevalence of smoking in Minnesota since MATS 1999 have been encouraging smokers to quit and supporting former smokers in sustaining a successful quit. Clearly, Minnesota smokers want to quit. Over half (52.4 percent) of smokers in Minnesota attempted to quit in the past year, a rate that has remained stable since 2003. Minnesota's comprehensive tobacco

control program supported smokers' efforts to quit with several different stop-smoking programs.

In particular, Minnesota has provided every Minnesota smoker with individual-level treatment options to help overcome nicotine addiction. These evidence-based programs that combine behavioral counseling and stop-smoking medications greatly increase the smoker's chance of successfully quitting. Minnesota smokers have either insurance coverage for effective stop-smoking medications through their health plans or access to free nicotine replacement therapy from ClearWay Minnesota. Among smokers making quit attempts in the 12 months before the survey, use of any medications increased. In 2007, 45 percent of smokers used medications in their last quit attempt, a relative increase of 50 percent since 2003. In 2007, over half of current smokers and former smokers who quit in the past year and who used some type of stop-smoking medication reported that they received financial support for these medications. Minnesota smokers have also increased use of behavioral counseling currently available in Minnesota through both telephone quitlines and the range of other face-to-face and web-based services provided through the combined efforts of the health plans and ClearWay Minnesota. In 2007, nearly 15 percent of smokers attempting to quit used some form of behavioral counseling, a major increase since 2003.

Media campaigns and other promotions have been used extensively in Minnesota to promote stop-smoking services. MATS 2007 shows that approximately 80 percent of current smokers and former smokers who quit in the past five years are aware of free stop-smoking programs. Despite this relatively high level awareness, over half of smokers who attempted to quit did not use any of the available forms of assistance during their most recent quit attempt. The use of behavioral counseling is particularly low compared with medications. Continued reductions in smoking prevalence will require sustained efforts to encourage more smokers to use these evidence-based approaches to quitting.

The Call it Quits collaborative, in particular, has encouraged systems-level change in the provider setting to encourage smokers to use these quitting resources. In addition, Blue Cross' Recognizing Excellence program has rewarded providers through a payment strategy for meeting high standards for documenting the

tobacco use status of every patient and advising patients who use tobacco to quit. Both efforts encourage and facilitate doctors and nurses, as well as other providers, to ask all patients if they smoke, advise those who smoke to quit and refer those who have any interest in quitting to behavioral counseling and appropriate medications. In 2007, smokers with a medical visit were more likely to report that their doctors and nurses advised them to quit than in 2003. In particular, the major increases among nurses in both asking and advising since 2003 suggest they may be playing a more prominent role in encouraging their patients to quit. Pharmacy and dental settings offer an additional opportunity for more outreach to smokers.

For more smokers to quit and stay quit, the social environments that facilitate smoking and make quitting difficult must also continue to change. Minnesota's tobacco control partners supported communities in advocating for local ordinances that do not allow smoking in indoor workplaces, including restaurants and bars. While the primary goal of such local ordinances is to protect Minnesotans from exposure to secondhand smoke, an important secondary benefit of these policies is that they make smoking less normal and quitting more attractive. Because MATS 2007 data collection occurred before the implementation of Minnesota's Freedom to Breathe Act, which made all Minnesota workplaces smoke-free, MATS provides the opportunity to compare the communities with and without such ordinances. MATS 2007 provides initial evidence, though non-conclusive, that living in a community with a smoke-free ordinance might be associated with increased quit attempts. In addition, smokers report that these community ordinances and home rules have helped them think about quitting, reduce their cigarette use and make a quit attempt. These findings demonstrate the importance of smoke-free environments. MATS 2010 will measure the potentially larger impact of Freedom to Breathe on quitting.

Finally, Minnesota's tobacco control partners successfully advocated for a state law to increase the cost of each pack of cigarettes with a 75-cent fee. The MATS findings demonstrate that this policy had a major impact on encouraging smokers and former smokers in the past two years to make and maintain quit attempts. This finding is consistent with cigarette consumption data for the state of Minnesota, which shows a significant decline from fiscal year 2005 to 2006; the total pack

consumption declined from 334.7 million to 285.5 million packs, or 49.2 million packs; i.e., total pack consumption declined 14.7 percent.[26] This reduction following the 2005 increase in the cost of tobacco products may be attributable to fewer people smoking, smokers smoking fewer cigarettes, or both.

MATS 2010 will continue to monitor the impact of ongoing programs and policy changes on quitting among Minnesotans.

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4. Secondhand Smoke Exposure among Minnesota Adults

4.1 Introduction

One of the key components of a comprehensive tobacco control strategy is to eliminate exposure to secondhand smoke. This strategy is based on the clear scientific evidence that has accumulated about the various health conditions that are directly caused or exacerbated by exposure to secondhand smoke. The CDC estimates that in the United States in 2005, 3,000 adult nonsmokers died of lung cancer related to exposure to secondhand smoke. Each year, an additional 46,000 U.S. adult nonsmokers die from coronary heart disease, and an estimated 430 newborns die of sudden infant death syndrome (SIDS). All of these deaths are related to secondhand smoke exposure.[1] Nonsmokers are exposed to the effects of tobacco smoke from secondhand smoke not only when they are near the actual smoking but also for varying amounts of time after the smoking has stopped.[2]

Secondhand Smoke Policy in the United States and in Minnesota
Table 4-1 presents a timeline of tobacco control and secondhand smoke policy in Minnesota. In 1975, Minnesota became the first state in the nation to pass a law limiting smoking in the workplace. The historic Minnesota Clean Indoor Air Act regulated many workplaces, with the notable exception of factories, warehouses and the hospitality industry (which includes restaurants and bars). Although a landmark piece of health legislation, the law only required restaurants to provide nonsmoking sections for customers.

By the time the Clean Indoor Air Act was passed in 1975, scientists had established the hazards of direct smoking, but there had been less research on the health impacts of exposure to secondhand smoke. In 1986, U.S. Surgeon General C. Everett Koop issued the first Surgeon General's report on secondhand smoke, which reviewed all available scientific evidence and concluded that exposure to secondhand smoke causes serious diseases, including lung cancer, in nonsmokers.

Table 4-1. Major milestones in reducing secondhand smoke exposure, from 1975 to 2007

1975 Minnesota enacts Clean Indoor Air Act.

1986 The first Surgeon General report on secondhand smoke, *The Health Consequences of Involuntary Smoking: A Report of the Surgeon General,* is released.

1989 U.S. Congress votes to prohibit smoking on all domestic airlines.

1994 California becomes the first state to enact a smoke-free law that applies to most workplaces and includes restaurants; expanded to bars in 1998.

2000 Moose Lake becomes the first Minnesota community to pass a smoke-free ordinance.

2000 ClearWay Minnesota provides grants to support local community groups' efforts to eliminate secondhand smoke exposure in public places

2003 The Minnesota Clean Indoor Air Act is updated to include indoor offices and manufacturing facilities but still exempts restaurants and bar workers.

2004 MDH awards grants for educating communities about secondhand smoke exposure and organizing for local smoke-free policies.

2005 ClearWay Minnesota and Blue Cross and Blue Shield of Minnesota provide funds to local communities to help create and maintain smoke-free environments.

2005 Minneapolis and several metro suburbs implement smoke-free ordinances.

2006 St. Paul implements smoke-free ordinance.

2006 Second Surgeon General report on secondhand smoke, *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General,* is released.

2007 As of February, 15 Minnesota cities and counties have clean indoor air ordinances covering 38.1 percent of all Minnesotans.

2007 From February to May, the Minnesota Legislature considers and passes a statewide smoke-free indoor air law, called the Freedom to Breathe Act.

2007 On Oct. 1, Minnesota becomes the 20th state to implement a statewide smoke-free indoor air law.

With the medical community leading the way, the public and lawmakers began to call for policies to protect people from this very real danger. In 1989, the U.S. Congress voted to prohibit smoking on all domestic airline flights, and in 1994 California became the first state to enact a smoke-free law applying to most

workplaces, including restaurants. In 1998, that law was expanded to include all bars in California.

In Minnesota, the Minnesota Clean Indoor Air Act was updated in 2003 to remove most exemptions for indoor offices and manufacturing facilities. One notable exception remained: restaurant and bar workers were still not protected from exposure to secondhand smoke at their workplaces.

In 2006, U.S. Surgeon General Richard Carmona released the long-awaited follow-up to Dr. Koop's report on secondhand smoke. This report, *The Health Consequences of Involuntary Exposure to Tobacco Smoke,* marked the first time the Surgeon General had issued a report on secondhand smoke since 1986. According to this report, "[There is now] massive and conclusive scientific evidence documenting adverse effects of involuntary smoking on children and adults, including cancer and cardiovascular diseases in adults, and adverse respiratory effects in both children and adults." The report further noted that among infants and children, secondhand smoke exposure causes low birth weight, acute lower respiratory illness, middle ear infections and asthma—and Sudden Infant Death Syndrome (SIDS).

The impact of secondhand smoke on Minnesotans was addressed in *Health Care Costs and Secondhand Smoke: The Bottom Line,* a 2007 report from Blue Cross.[3] This study found that, in 2003, more than 66,000 Minnesotans, both adults and children, suffered from diseases caused by secondhand smoke, including lung cancer and heart disease. These diseases are also some of the costliest to treat. It cost an estimated $215.7 million (expressed in 2006 dollars) to treat health conditions caused by exposure to secondhand smoke. More importantly, exposure to secondhand smoke caused at least 581 deaths among infants and adults in Minnesota. Released in March 2007, this study helped document the human and economic cost of *not* having a strong statewide smoke-free law.

In Minnesota, tobacco control professionals and other public and private health advocates worked to raise public awareness about the danger of secondhand smoke exposure and to advocate for stronger smoke-free policies. Local governments across the state took the lead in passing strong local smoke-free ordinances. Beginning in 2000, the communities of Moose Lake, Cloquet and Duluth passed

smoke-free ordinances protecting hospitality workers and customers from secondhand smoke. ClearWay Minnesota, Blue Cross and MDH supported grassroots community organizing through community grants and contracts between 2004 and 2007. Funded groups worked to raise awareness and advocate for policies to increase protection from secondhand smoke exposure in public places. By March 2006, many more communities—including Minneapolis, St. Paul and several metropolitan suburbs—had passed smoke-free policies. MATS 2007 found that 38.1±1.5 percent of adult Minnesotans lived in the 15 Minnesota cities and counties that had clean indoor air ordinances.

As the momentum of local smoke-free policies accelerated, so did interest in a statewide law. After an intense advocacy effort by many public and private groups, Minnesota's statewide comprehensive smoke-free law, known as the Freedom to Breathe Act, was passed on May 16, 2007. This law was implemented on Oct. 1, 2007, after MATS 2007 data collection was complete. Smoking is now prohibited in virtually all indoor public places and indoor places of employment including bars, restaurants and private clubs.

MATS 2007 data was collected in 2007, between February and June. Surveys were completed during the Minnesota Legislature's debate about the Freedom to Breathe Act. However, all interviews were completed well before the new law went into effect in October 2007. Therefore, the secondhand smoke exposure described in this section is limited to exposure before the Freedom to Breathe Act, when local ordinances protected about one-third of Minnesotans from secondhand smoke. The impact of Freedom to Breathe on Minnesotans' exposure to secondhand smoke will be measured in MATS 2010.

This chapter examines changes in attitudes and social norms regarding the acceptance of secondhand smoke exposure. The MATS 2007 results presented here examine the percentage of Minnesotans protected by smoke-free policies in the community, at workplaces and in the home as of June 2007. This chapter also presents the prevalence of exposure to secondhand smoke among Minnesotans in each of those settings.

4.2 Perceptions that Secondhand Smoke Is Harmful

Public perceptions of secondhand smoke's harmfulness vary and may have an effect on Minnesotans' interest in and support for clean indoor air ordinances. Tobacco control organizations in Minnesota conduct extensive community outreach efforts and implement media campaigns to raise Minnesotans' awareness about the harm of secondhand smoke.

ClearWay Minnesota uses communications and outreach activities to help educate Minnesotans about the dangers of secondhand smoke. ClearWay Minnesota uses television, radio, Internet and printed advertising that draws attention to the dangers of secondhand smoke and its effects on workers, nonsmokers and families. In addition to the advertising activities that ClearWay Minnesota undertakes, the organization conducts an outreach program of community visits, media interviews and meetings with community leaders. This outreach engages people at the local level, providing an opportunity for them to learn more about the impact of secondhand smoke on Minnesotans. ClearWay Minnesota's media campaign also includes customized outreach to diverse communities.

Blue Cross' statewide educational efforts focused primarily on encouraging support for a strong clean indoor air law. Print and radio advertisements sponsored by Blue Cross ran throughout the state at pivotal points during the 2007 legislative session.

MATS tracks Minnesotans' changing awareness and understanding of the harmfulness of secondhand smoke. This section examines the perceived harmfulness of secondhand smoke among Minnesotans.

Secondhand Smoke and Awareness of Its Effects

Secondhand smoke refers to the smoke generated from the burning end of a cigarette or other smoked tobacco product and from the exhaled smoke from the smoker.

Survey Questions

- Do you think that breathing smoke from other people's cigarettes is... very harmful to one's health, somewhat harmful to one's health, not very harmful to one's health, or not at all harmful to one's health?
- Would you say that breathing smoke from other people's cigarettes causes…

  Lung cancer in adults?
  Heart disease in adults?
  Respiratory problems in children?
  Sudden infant death syndrome or SIDS?

4.2.1 Perceptions of General Harm of Secondhand Smoke

Nearly all Minnesotans agree that secondhand smoke is harmful; 93.0±0.8 percent of Minnesotans say that secondhand smoke is very or somewhat harmful to health (Table 4-2).

Even a vast majority of current smokers (81.3±3.5 percent) agree that exposure to secondhand smoke is harmful, although former smokers (92.7±1.1 percent) and never smokers (96.7±0.7 percent) are more likely to hold this view. While all of these differences are statistically significant, the magnitude of the difference between current smokers and the others is noteworthy.

Although there are statistically significant differences by education, income and smoking status, 85 percent to 95 percent of the members of all subgroups agree that secondhand smoke is harmful. Men (90.4±1.3 percent) are less likely to believe secondhand smoke is harmful than women (95.6±0.9 percent). The group with the lowest level of educational attainment (88.1±3.7 percent) is less likely than every other educational group (which vary from 91.7 percent to 95.3 percent) to agree that secondhand smoke is harmful. Similarly, people with the lowest income (91.2±1.9 percent) less often agree on the harm of secondhand smoke than people with the

highest income (95.0±1.0 percent). While some of the differences among education and income groups are statistically significant, the actual differences are small.

Table 4-2. Agreement that secondhand smoke is harmful in various ways, by selected demographic characteristics and smoking status

Characteristics	Secondhand smoke is very or somewhat harmful	Secondhand smoke causes lung cancer in adults	Secondhand smoke causes heart disease in adults	Secondhand smoke causes respiratory problems in children	Secondhand smoke causes SIDS
	%	%	%	%	%
Overall	**93.0** ± 0.8	**92.7** ± 0.8	**87.3** ± 1.2	**95.7** ± 0.8	**67.3** ± 2.0
Age					
18 to 24	**94.2** ± 2.3	**94.3** ± 2.3	**88.0** ± 3.9	**95.9** ± 2.9	**75.0** ± 5.2
25 to 44	**95.2** ± 1.3	**94.0** ± 1.5	**87.5** ± 2.4	**96.9** ± 1.2	**70.5** ± 3.6
45 to 64	**91.6** ± 1.4	**90.8** ± 1.3	**86.8** ± 1.6	**94.6** ± 1.3	**59.0** ± 2.9
65 or older	**89.9** ± 1.6	**91.7** ± 1.4	**86.9** ± 1.7	**95.1** ± 1.1	**66.0** ± 3.2
Gender					
Female	**95.6** ± 0.9	**95.1** ± 0.9	**90.3** ± 1.3	**97.2** ± 0.9	**74.1** ± 2.2
Male	**90.4** ± 1.3	**90.1** ± 1.4	**84.2** ± 2.1	**94.2** ± 1.2	**59.6** ± 3.3
Education					
Less than high school	**88.1** ± 3.7	**88.7** ± 4.1	**83.4** ± 5.3	**92.8** ± 3.9	**69.8** ± 7.2
High school graduate/GED	**91.7** ± 1.8	**92.5** ± 1.8	**86.9** ± 2.5	**95.2** ± 1.7	**66.2** ± 4.0
Some college or technical school	**93.6** ± 1.3	**91.4** ± 1.5	**86.5** ± 2.2	**95.4** ± 1.0	**65.1** ± 3.4
College graduate or beyond	**95.3** ± 0.8	**95.4** ± 0.8	**89.6** ± 1.6	**97.4** ± 1.0	**70.3** ± 2.9
Household income					
$35,000 or less	**91.2** ± 1.9	**90.1** ± 2.2	**85.7** ± 2.7	**93.6** ± 2.2	**69.0** ± 3.8
$35,001 to $50,000	**92.9** ± 2.1	**92.3** ± 2.1	**85.7** ± 3.5	**95.5** ± 2.0	**65.4** ± 5.5
$50,001 to $75,000	**92.0** ± 2.1	**92.6** ± 1.9	**85.8** ± 2.7	**96.1** ± 1.4	**68.3** ± 4.2
$75,001 or more	**95.0** ± 1.0	**94.3** ± 1.1	**89.1** ± 2.1	**97.1** ± 0.8	**66.7** ± 3.5
Smoking status					
Current Smokers	**81.3** ± 3.5	**79.6** ± 3.5	**73.4** ± 4.0	**88.6** ± 3.1	**46.7** ± 5.9
Former Smokers	**92.7** ± 1.1	**92.3** ± 1.4	**86.9** ± 2.2	**95.2** ± 1.4	**62.7** ± 3.6
Never smokers	**96.7** ± 0.7	**96.5** ± 0.7	**91.5** ± 1.5	**98.0** ± 0.7	**76.0** ± 2.4

Source: Minnesota Adult Tobacco Survey, 2007

4.2.2 Perceptions of Specific Harm of Secondhand Smoke

The majority of Minnesotans recognize the specific diseases caused by secondhand smoke exposure. Similar to the finding on the general harm of secondhand smoke exposure, current smokers are less likely to believe in the specific harm caused by secondhand smoke than former and never smokers, except in the case of respiratory problems in children. As shown in Table 4-2, between 87 percent and 96 percent of Minnesotans think that secondhand smoke causes respiratory problems in children, lung cancer in adults and heart disease in adults. Over 65 percent (67.3±2.0 percent) think that secondhand smoke causes sudden infant death syndrome.

The subgroup patterns for the questions on lung cancer, heart disease and respiratory harm in children are the same as for the question on general harm caused by secondhand smoke. Statistically significant differences occur by gender, education, income and smoking status.

Two other notable patterns appear in relation to beliefs about the diseases specific to children. First, current smokers are more like nonsmokers in their level of agreement with regard to secondhand smoke's causal relationship to respiratory problems in children. Second, beliefs about SIDS differed from the general pattern. The differences by smoking status are much larger for SIDS. Current smokers (46.7±5.9 percent) are much less likely than former smokers (62.7±3.6 percent) and never smokers (76.0±2.4 percent) to think that secondhand smoke causes SIDS. Furthermore, 18-24-year-olds (75.0±5.2 percent) and 25-44-year-olds (70.5±3.6 percent) are more likely to think secondhand smoke causes SIDS than the 45-64-year-olds (59.0±2.9 percent). Finally, the greatest difference between men and women on the health effects of secondhand smoke occurs on the subject of SIDS, with 74.1±2.2 percent of women believing it causes SIDS, compared with 59.6±3.3 percent of men.

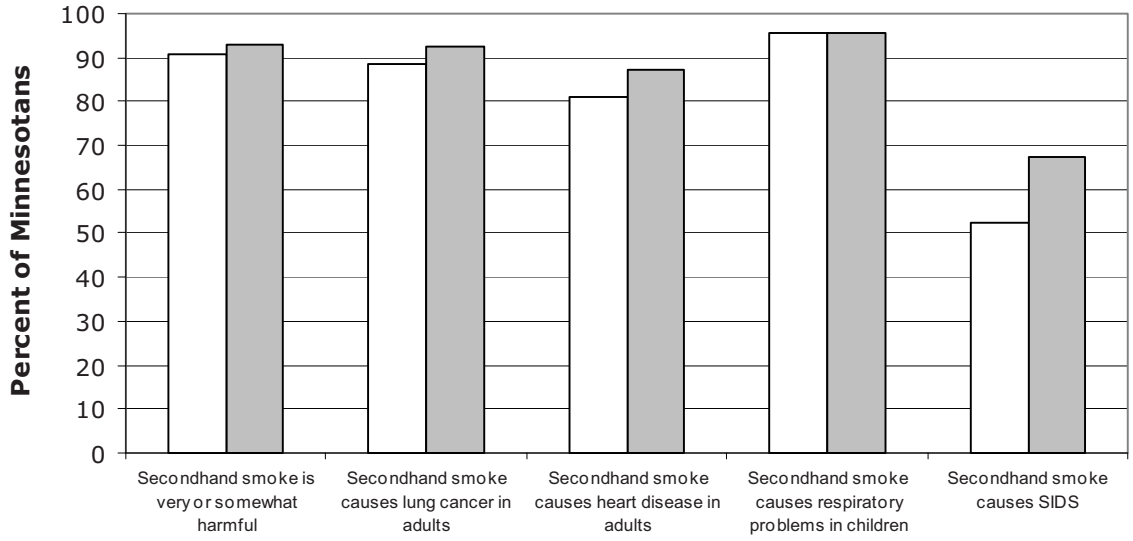
4.2.3 Perceptions that Secondhand Smoke Is Harmful, 2003 to 2007

Between 2003 and 2007, the percentage of Minnesotans who believe that secondhand smoke is very or somewhat harmful increased from 90.9±1.2 percent to 93.0±0.8 percent (Figure 4-1). This increase of 2.2±1.4 percentage points is statistically significant.

Between 2003 and 2007, there were increases in each of the percentages of Minnesotans who recognize the four specific diseases caused by secondhand smoke exposure (Figure 4-1). The large and statistically significant increase in awareness about the relationship of secondhand smoke to SIDS, from 52.3±2.7 percent to 67.3±2.0 percent, is perhaps the most striking, although evidence of this relationship is more recent than for the other tobacco-related conditions assessed in MATS 2007. Statistically significant increases occurred for awareness of adult lung cancer and heart disease. Awareness of the relationship between secondhand smoke and heart disease evidences the next highest increase of 6.4±2.0 percent, from 80.9±1.6 percent to 87.3±1.2 percent. Even though awareness of the relationship between secondhand smoke and lung cancer was already high in 2003, at 88.8±1.2 percent, it increased by an additional 3.9±1.4 percent to 92.7±0.8 percent in 2007. The awareness that secondhand smoke causes respiratory problems in children showed no increase

(0.1±1.0 percent), but the same considerations apply to this condition as to awareness of the general harm from secondhand smoke: the level of awareness in 2003 (95.6±0.7 percent) was already approaching 100 percent, so it is challenging to achieve sizable further increases. In such situations, maintaining the high level of awareness is an important accomplishment.

Figure 4-1. Agreement that secondhand smoke is harmful in various ways, from 2003 to 2007



Agreement on harmful effects of secondhand smoke

Year	Secondhand smoke is very or somewhat harmful	Secondhand smoke causes lung cancer in adults	Secondhand smoke causes heart disease in adults	Secondhand smoke causes respiratory problems in children	Secondhand smoke causes SIDS
2003	90.9 ± 1.2	88.8 ± 1.2	80.9 ± 1.6	95.6 ± 0.7	52.3 ± 2.7
2007	93.0 ± 0.8	92.7 ± 0.8	87.3 ± 1.2	95.7 ± 0.8	67.3 ± 2.0
Change over time 2003 to 2007	2.2 ± 1.4 %*	3.9 ± 1.4 %*	6.4 ± 2.0 %*	0.1 ± 1.0 %	14.9 ± 3.3 %*

* Statistically significant at the 95% confidence level

4.3 Support for Smoke-free Policies

By the time of data collection for MATS 2007, 15 Minnesota cities and counties had adopted clean indoor air policies. Since MATS was conducted before the implementation of the statewide Freedom to Breathe legislation, the MATS 2007

data allow a unique opportunity to examine Minnesotans' support for such policies during a period of transition.

Support for Smoke-free Policies

MATS tracks people's preferences for smoke-free environments in certain settings as indicators of their support for public and private policies regarding smoking in those settings. The settings include workplaces in general and bars and restaurants.

Survey Questions

- How important is it to you to have a smoke-free environment inside workplaces, including restaurants and bars? Is it…very important, somewhat important, not too important, or not at all important?
- {In your indoor work areas/At those times when you are indoors during work} do you prefer to work where smoking is allowed, not allowed, or does it make no difference?
- Is there a ban on smoking in restaurants and bars in your area?
- {Because of this ban/If there were a ban} on smoking in restaurants and bars, {do/would} you go out more, less, or {does/would} it make no difference?

Because of the multiple local smoke-free policies in Minnesota communities at the time of MATS 2007, the last question was modified depending on whether the respondent believed that he or she lived in an area with a local smoke-free policy in place. Similarly, the second question was modified depending on the respondent's previous answers regarding his or her primary work location. See section 4.4.2 for the questions relating to various types of workplaces.

4.3.1 Support for Smoke-free Policies in Workplaces

Eighty percent of Minnesotans agree that having a smoke-free environment inside workplaces, including bars and restaurants, is important. Among all Minnesotans, 59.9±1.6 percent say that a smoke-free policy in workplaces (including restaurants and bars) is very important, and an additional 20.4±1.4 percent say that it is somewhat important (Table 4-3).

About 20 percent (19.8±3.3 percent) of smokers say a workplace smoke-free policy is very important, compared with 59.5±2.8 percent of former smokers and 71.8±2.0

Table 4-3. Importance of having a smoke-free environment inside workplaces, by selected demographic characteristics and smoking status

Characteristics	Very important	Somewhat important	Not too important	Not at all important	Row total
	%	%	%	%	%
Overall	**59.9** ± 1.6	**20.4** ± 1.4	**9.9** ± 1.1	**9.9** ± 1.1	**100**
Age					
18 to 24	**44.2** ± 5.2	**32.3** ± 5.2	**11.8** ± 3.5	**11.8** ± 3.1	**100**
25 to 44	**59.1** ± 3.2	**20.6** ± 2.6	**10.9** ± 2.3	**9.3** ± 2.1	**100**
45 to 64	**64.6** ± 2.3	**17.0** ± 1.7	**8.3** ± 1.3	**10.3** ± 1.6	**100**
65 or older	**63.9** ± 2.3	**17.9** ± 1.9	**9.1** ± 1.4	**9.0** ± 1.5	**100**
Gender					
Female	**68.7** ± 2.0	**17.8** ± 1.6	**7.4** ± 1.4	**6.2** ± 1.1	**100**
Male	**50.8** ± 2.5	**23.0** ± 2.2	**12.4** ± 1.8	**13.7** ± 1.8	**100**
Education					
Less than high school	**47.5** ± 6.4	**20.7** ± 5.1	**15.9** ± 6.9	**16.0** ± 4.3	**100**
High school graduate/GED	**49.4** ± 3.3	**23.7** ± 2.8	**12.0** ± 2.2	**15.0** ± 2.8	**100**
Some college or technical school	**58.1** ± 2.9	**22.2** ± 2.7	**10.6** ± 1.8	**9.1** ± 1.5	**100**
College graduate or beyond	**76.4** ± 2.0	**14.8** ± 1.7	**5.0** ± 1.2	**3.8** ± 0.8	**100**
Household income					
$35,000 or less	**54.4** ± 3.3	**21.7** ± 3.0	**10.9** ± 1.9	**13.1** ± 2.2	**100**
$35,001 to $50,000	**53.4** ± 4.6	**22.0** ± 3.9	**13.3** ± 4.4	**11.4** ± 2.6	**100**
$50,001 to $75,000	**56.1** ± 3.8	**23.7** ± 3.3	**10.3** ± 2.5	**9.9** ± 2.8	**100**
$75,001 or more	**68.2** ± 2.7	**17.4** ± 2.0	**7.4** ± 1.6	**7.0** ± 1.9	**100**
Smoking status					
Current smokers	**19.8** ± 3.3	**24.9** ± 3.9	**23.5** ± 4.4	**31.8** ± 4.3	**100**
Former smokers	**59.5** ± 2.8	**21.0** ± 2.3	**10.9** ± 2.2	**8.6** ± 1.5	**100**
Never smokers	**71.8** ± 2.0	**18.8** ± 1.8	**5.5** ± 0.9	**4.0** ± 1.1	**100**

Source: Minnesota Adult Tobacco Survey, 2007

percent of never smokers, both showing large and statistically significant differences from smokers. Further, there are some sizable and statistically significant differences in levels of support for a workplace smoke-free policy by age, gender, education and income. The two oldest age groups, 65 or older (63.9±2.3 percent) and 45-64 (64.6±2.3 percent), are more likely to say that a workplace smoke-free policy is very important than the younger age groups, 25-44 (59.1±3.2) and 18-24 (44.2±5.2 percent). In addition, women (68.7±2.0 percent) are more likely than men (50.8±2.5 percent) to think a workplace smoke-free policy is very important. College graduates (76.4±2.0 percent) and those with incomes of over $75,000 (68.2±2.7 percent) are considerably more likely to say that a smoke-free policy is very important compared with those with less education and income, respectively.

Eighty percent (80.0±1.8 percent) of Minnesotans also say they would prefer to work at a place where smoking is not allowed indoors (Table 4-4). As in the case of other work-related smoking regulation, smokers demonstrate very different preferences. Only 40 percent (39.6±5.3 percent) of current smokers assert that they would prefer to work where smoking is not allowed, compared with 82.8±3.3 percent of former smokers and 90.5±1.7 percent of never smokers. Less than 10 percent (8.6±3.2 percent) of current smokers express a preference for a work area where smoking is allowed; 51.2±5.7 percent are indifferent.

Table 4-4. Preference to work where smoking is allowed/is not allowed when working indoors, by selected demographic characteristics and smoking status

Characteristics	Preference				
	Smoking allowed	Smoking not allowed	Makes no difference	Never works indoors	Row total
	%	%	%	%	%
Overall	**1.7** ± 0.6	**80.0** ± 1.8	**17.9** ± 1.8	**0.3** ± 0.3	**100**
Age					
18 to 24	**2.4** ± 2.0	**73.8** ± 5.2	**23.7** ± 4.9	**0.1** ± 0.1	**100**
25 to 44	**1.7** ± 0.8	**78.7** ± 3.3	**19.2** ± 3.2	**0.4** ± 0.5	**100**
45 to 64	**1.7** ± 0.9	**83.8** ± 1.9	**14.1** ± 1.7	**0.3** ± 0.3	**100**
65 or older	**0.7** ± 0.9	**78.8** ± 5.9	**20.4** ± 5.9	**0.0** ± 0.0	**100**
Gender					
Female	**1.0** ± 0.6	**87.8** ± 2.2	**11.0** ± 2.1	**0.3** ± 0.5	**100**
Male	**2.4** ± 1.0	**73.1** ± 2.8	**24.1** ± 2.8	**0.4** ± 0.3	**100**
Education					
Less than high school	**4.0** ± 4.0	**59.3** ± 13.4	**36.5** ± 13.6	**0.2** ± 0.5	**100**
High school graduate/GED	**2.6** ± 1.6	**68.6** ± 4.3	**28.2** ± 4.2	**0.6** ± 0.8	**100**
Some college or technical school	**1.7** ± 0.9	**79.5** ± 2.8	**18.4** ± 2.7	**0.4** ± 0.4	**100**
College graduate or beyond	**0.8** ± 0.4	**92.9** ± 1.5	**6.3** ± 1.5	**0.1** ± 0.1	**100**
Household income					
$35,000 or less	**2.7** ± 1.5	**71.2** ± 5.1	**25.9** ± 5.0	**0.3** ± 0.4	**100**
$35,001 to $50,000	**2.0** ± 1.2	**71.3** ± 6.1	**26.0** ± 6.1	**0.8** ± 0.9	**100**
$50,001 to $75,000	**1.1** ± 1.0	**80.7** ± 3.7	**18.1** ± 3.6	**0.1** ± 0.1	**100**
$75,001 or more	**1.5** ± 1.0	**86.9** ± 2.1	**11.6** ± 1.9	**0.1** ± 0.1	**100**
Smoking status					
Current smokers	**8.6** ± 3.2	**39.6** ± 5.3	**51.2** ± 5.7	**0.6** ± 0.5	**100**
Former smokers	**0.7** ± 0.5	**82.8** ± 3.3	**16.3** ± 3.3	**0.3** ± 0.5	**100**
Never smokers	**0.2** ± 0.1	**90.5** ± 1.7	**9.0** ± 1.6	**0.3** ± 0.4	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Age, gender, education and income groups demonstrate some statistically significant differences in this preference but generally follow the same pattern noted for support for smoke-free policies in all workplaces. Older age groups,

women, college graduates and Minnesotans with higher incomes demonstrate a greater preference for working in an environment that has a smoke-free policy.

4.3.2 Restaurant and Bar Smoke-free Policies and Going Out

MATS measured the impact of restaurant and bar smoke-free ordinances on going out. For people who believed that they lived in a community that had already implemented a smoke-free ordinance, these responses indicate actual behavior. For those who believed that their community did not have such an ordinance, these responses are more speculative. Their version of the question asked them to imagine what they would do "if there were a ban" in their community. MATS 2007 found no difference in actual or likely behavior between those who believed they lived in a community with a smoke-free ordinance in place, compared with those who did not perceive that an ordinance was in place at the time of the survey.

Over 90 percent of Minnesotans report that they would go out the same amount or more often if smoking were not allowed in bars and restaurants (Table 4-5). Nearly 70 percent (69.6±1.4 percent) of Minnesotans say that a smoke-free ordinance makes no difference in how often they go out, and 23.4±1.2 percent of Minnesotans do or would go out more often. This more than offsets (nearly three times) the 7.0±0.9 percent who do or would go out less often. These findings suggest that the overwhelming majority of Minnesotans would support smoke-free bars and restaurants through their continued patronage.

College graduates (36.6±2.2 percent) are more likely to go out more as a result of a smoke-free ordinance than those with some college (22.0±2.2 percent), a high school degree (15.9±2.2 percent) and those with less than a high school degree (10.0±2.8 percent). The difference between college graduates and all other education groups is statistically significant. Similarly, those with the highest incomes of over $75,000 (31.2±2.3 percent) say they are much more likely to go out more as a result of a smoke-free ordinance than those with incomes of $50,001 to $75,000 (23.2±2.8 percent), those with incomes of $35,001 to $50,000 (19.3±3.1 percent) and those with incomes equal to $35,000 or less (16.0±2.3 percent).

Table 4-5. Effect of actual and proposed smoking restrictions in restaurants and bars on going out, by selected demographic characteristics and smoking status

Characteristics	Do/would go out more	Do/would go out less	Does not/would not make a difference	Row total
	%	%	%	%
Overall	**23.4** ± 1.2	**7.0** ± 0.9	**69.6** ± 1.4	**100**
Age				
18 to 24	**17.5** ± 3.5	**7.2** ± 2.6	**75.3** ± 4.2	**100**
25 to 44	**27.9** ± 2.5	**6.9** ± 1.6	**65.2** ± 2.7	**100**
45 to 64	**24.0** ± 1.8	**8.5** ± 1.6	**67.4** ± 2.2	**100**
65 or older	**14.9** ± 1.6	**3.6** ± 0.9	**81.5** ± 1.8	**100**
Gender				
Female	**27.3** ± 1.7	**6.0** ± 1.1	**66.7** ± 1.9	**100**
Male	**19.3** ± 1.8	**8.0** ± 1.5	**72.7** ± 2.1	**100**
Education				
Less than high school	**10.0** ± 2.8	**9.6** ± 3.4	**80.4** ± 4.3	**100**
High school graduate/GED	**15.9** ± 2.2	**10.1** ± 2.4	**74.0** ± 2.9	**100**
Some college or technical school	**22.0** ± 2.2	**7.3** ± 1.3	**70.7** ± 2.5	**100**
College graduate or beyond	**36.6** ± 2.2	**2.7** ± 0.8	**60.7** ± 2.2	**100**
Household income				
$35,000 or less	**16.0** ± 2.3	**9.1** ± 2.1	**75.0** ± 2.9	**100**
$35,001 to $50,000	**19.3** ± 3.1	**9.0** ± 2.4	**71.7** ± 3.8	**100**
$50,001 to $75,000	**23.2** ± 2.8	**6.2** ± 1.5	**70.6** ± 3.1	**100**
$75,001 or more	**31.2** ± 2.3	**5.0** ± 1.5	**63.7** ± 2.5	**100**
Smoking status				
Current smokers	**1.9** ± 1.2	**28.7** ± 4.2	**69.4** ± 4.2	**100**
Former smokers	**21.8** ± 2.1	**3.1** ± 0.9	**75.1** ± 2.2	**100**
Never smokers	**30.4** ± 1.8	**2.3** ± 0.7	**67.3** ± 1.9	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Focusing on smoking status, only 1.9±1.2 percent of current smokers say they are more likely to go out because of an ordinance, while 28.7±4.2 percent of current smokers say they are likely to go out less often because of an ordinance. The remainder of smokers, 69.4±4.2 percent, would go out just as often. Among former smokers, 21.8±2.1 percent say they would go out more often, while 3.1±0.9 percent would go out less often because of a smoke-free ordinance. Over 30 percent (30.4±1.8 percent) of never smokers would go out more because of an ordinance, while only 2.3±0.7 percent would go out less.

The patterns found in the overall population are repeated among those who go out once a week or more. Overall, 28.9±1.8 percent say they would or do go out more because of a smoke-free ordinance, while 64.5±1.9 percent say it would make no

difference in how much they go out. Only 6.6±1.3 percent of those who go out once a week or more say they do or would go out less because of a smoke-free ordinance.

4.3.3 Support for Smoke-free Policies, 2003 to 2007

Between 2003 and 2007, the percentage of Minnesotans who support smoke-free policies in their workplace increased. In 2003, 75.0±1.9 percent of Minnesotans said they would prefer to work in a place where smoking was not allowed indoors (Table 4-6). This increased to 80.0±1.8 percent in 2007, a statistically significant increase of 5.1 percentage points.

Table 4-6. Preference to work where smoking is allowed/is not allowed when working indoors, from 2003 to 2007

Preference	2003	2007	Change over time 2003 to 2007
	%	%	%
Smoking allowed	**2.2** ± 0.6	**1.7** ± 0.6	**-0.4** ± 0.8
Smoking not allowed	**75.0** ± 1.9	**80.0** ± 1.8	**5.1** ± 2.7 *
Makes no difference	**22.7** ± 1.9	**17.9** ± 1.8	**-4.7** ± 2.6 *
Never works indoors	**0.2** ± 0.1	**0.3** ± 0.3	**0.1** ± 0.3

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

The percentage of Minnesotans who said they would (or already do) go out more if smoking were not allowed in bars and restaurants increased from 16.1±1.5 percent to 23.4±1.2 percent. This increase is statistically significant. Similar statistically significant increases can be seen in Table 4-7 among every subgroup except for 18-24-year-olds, those with less than a high school education, and current smokers. The largest statistically significant increases occurred among 25-44-year-olds (10.4±3.8 percentage points) and among those with at least a college education (15.4±3.4 percentage points). It is important to note that the question asked in 2007 was different from the question that was asked in 2003. In 2007, the survey asked whether the respondent would go out to *bars and* restaurants; in 2003, the question asked just about restaurants. Therefore, the standard is much higher in 2007, suggesting the increases since 2003 signal an even larger shift in attitudes.

Table 4-7. Minnesotans who do/would go out more because of actual or potential restrictions on smoking in restaurants and bars, from 2003 to 2007

Characteristics	2003	2007	Change over time 2003 to 2007
	%	%	%
Overall	**16.1** ± 1.5	**23.4** ± 1.2	**7.3** ± 1.9 *
Age			
18 to 24	**13.4** ± 2.9	**17.5** ± 3.5	**4.1** ± 4.6
25 to 44	**17.6** ± 2.8	**27.9** ± 2.5	**10.4** ± 3.8 *
45 to 64	**16.9** ± 2.4	**24.0** ± 1.8	**7.1** ± 3.0 *
65 or older	**12.5** ± 2.1	**14.9** ± 1.6	**2.4** ± 2.6
Gender			
Female	**18.6** ± 1.9	**27.3** ± 1.7	**8.7** ± 2.6 *
Male	**13.4** ± 2.2	**19.3** ± 1.8	**5.9** ± 2.8 *
Education			
Less than high school	**11.1** ± 4.1	**10.0** ± 2.8	**-1.1** ± 5.0
High school graduate/GED	**12.1** ± 2.1	**15.9** ± 2.2	**3.8** ± 3.1 *
Some college or technical school	**16.9** ± 3.2	**22.0** ± 2.2	**5.2** ± 3.9 *
College graduate or beyond	**21.3** ± 2.5	**36.6** ± 2.2	**15.4** ± 3.4 *
Smoking status			
Current smokers	**2.2** ± 1.2	**1.9** ± 1.2	**-0.3** ± 1.7
Former smokers	**13.5** ± 2.0	**21.8** ± 2.1	**8.3** ± 2.9 *
Never smokers	**22.0** ± 2.4	**30.4** ± 1.8	**8.4** ± 3.0 *

*Statistically significant at the 95% confidence level

Note: The question asked in 2007 was different from the question asked in 2003. In 2007, the survey asked whether the respondent would go out to bars and restaurants; in 2003, the question asked about just restaurants.

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

4.4 Minnesotans Covered by Smoke-free Policies

Given the high awareness of the dangers of secondhand smoke, Minnesotans have acted to protect themselves, their coworkers and their families from exposure by establishing smoke-free policies in their communities, workplaces, cars and homes. The larger the scope of the policy, the greater the protection for Minnesotans. At the time of the 2007 survey, local ordinances covered some but not all workplaces across the state. Between 2000 and 2007, a number of local governments passed workplace policies in Minnesota extending protection from secondhand smoke to bars, restaurants and other public settings, thereby protecting not only the workers in these settings but also their patrons. Workplace policies protect a large number of

people in settings where Minnesotans spend a lot of time. Voluntary policies in the home or car set rules that protect family members and friends in those settings.

4.4.1 Smoke-free Policies in the Community

Smoke-free Policies in the Community

MATS obtained information about public policies regarding smoking in bars and restaurants in two ways.

Survey Question

The first way was to ask respondents the following question:

- Is there a ban on smoking in bars and restaurants in your area?

This question reveals people's perception of whether there is a formal, legal ban in their community, independent of whether there really is such a ban. The term "area" was deliberately adopted to find out whether people felt there is a policy affecting their lifestyle, even if it is not in the formal jurisdiction in which they live.

The second way was to obtain each respondent's county of residence and ZIP code to determine if the person actually resided in a Minnesota county or other local jurisdiction where an ordinance against smoking in bars and restaurants had actually been enacted by the time of MATS 2007.

As of Dec. 31, 2006, there were clean indoor air ordinances that did not allow smoking in restaurants and/or bars in 15 Minnesota cities and counties (Table 4-8). These community ordinances varied in strength, particularly in whether they included bars as well as restaurants.

Using county of residence and ZIP code to identify respondents who lived in a community or county with such an ordinance, these clean indoor air policies covered 38.1±1.5 percent of Minnesotans, as estimated from the survey sample. There are no statistically significant differences in coverage by age, gender, education, income or smoking status.

Table 4-8. Minnesota cities and counties with smoke-free ordinances as of Dec. 31, 2006

Cities	Counties
Bloomington Cloquet Duluth Golden Valley International Falls Mankato Minneapolis Moorhead Moose Lake St. Paul	Beltrami Hennepin McLeod Olmsted Ramsey

However, 59.1±1.6 percent of Minnesotans in 2007 said their community was covered by a smoke-free ordinance that did not allow smoking in restaurants and bars. There are no differences in the perceived existence of such an ordinance by age, gender, education, income or smoking status. The discrepancy between actual and perceived clean indoor air coverage is likely due to false reports of ordinances by people who live near the boundaries of a city or county with a clean indoor air policy or by those who assume such a policy is in place, perhaps because of news coverage of the general topic. The first factor, if real, would suggest that the effect of a clean indoor air ordinance may spread beyond the boundaries of the city or county in which it was passed and enacted. This finding may also reflect the differences between communities where Minnesotans live and those where they work and visit. Many Minnesotans living in the Twin Cities metro area might have been living in a community without a smoke-free policy, but working and going out to eat in a nearby community that did have a smoke-free policy. Therefore, when asked about a policy "in their area" respondents might have thought more broadly than just their ZIP code area.

Among those who said there was a smoke-free ordinance in their community, 58.5±2.2 percent did live in a community with an ordinance, as determined geographically. However, among those who said there was no ordinance in their community, 89.6±2.0 percent did not live in a community with an ordinance, as

determined. The remainder of this chapter uses the geographically determined definition when speaking of the presence or absence of smoke-free ordinances.

4.4.2 Smoke-free Policies at Work

Smoke-free Policies at Work

MATS collects information about the smoking policies at Minnesotans' workplaces. All analyses of workplace policies are limited to Minnesotans who are employed.

Survey questions

- Which of the following best describes your place of work's official smoking policy for work areas? Smoking is…not allowed in any work areas, allowed in some work areas, allowed in all work areas, or there is no official smoking policy?
- Which of the following best describes your place of work's official smoking policy for indoor public or common areas, such as lobbies, rest rooms and lunchrooms? Smoking is…not allowed in any common areas, allowed in some common areas, allowed in all common areas, or there is no official smoking policy?
- At your workplace, is smoking allowed anywhere on the property outside the building?

MATS defines a smoke-free workplace by a combination of the first two questions. If the responses to both questions are that smoking is not allowed, this is construed to mean that smoking is not allowed in most areas.

The definition excludes people who work in their own homes from analyses of workplace smoking policies. Working at home is determined by the following question:

- What best describes where you work for money? Would you say it is a classroom, a hospital, an office, your home, other people's homes, a plant or factory, a store or warehouse, a restaurant that does not serve alcohol, a restaurant that serves alcohol, a bar, a vehicle, or some other setting?

Analysis of workplace policies is conducted separately for those working primarily in an indoor or outdoor setting using the following survey question:

- While working at your job, are you indoors most of the time?

Over three-quarters of Minnesotans (76.1±1.9 percent) say that smoking is not allowed in their work area or indoor common areas (Table 4-9). Among current smokers, 68.0±5.3 percent say that smoking is not allowed, while 78.4±3.4 percent of former smokers report that smoking is not allowed, a statistically significant difference.

Table 4-9. Minnesotans covered by smoke-free policies in work areas and indoor common areas at work, by selected demographic characteristics and smoking status

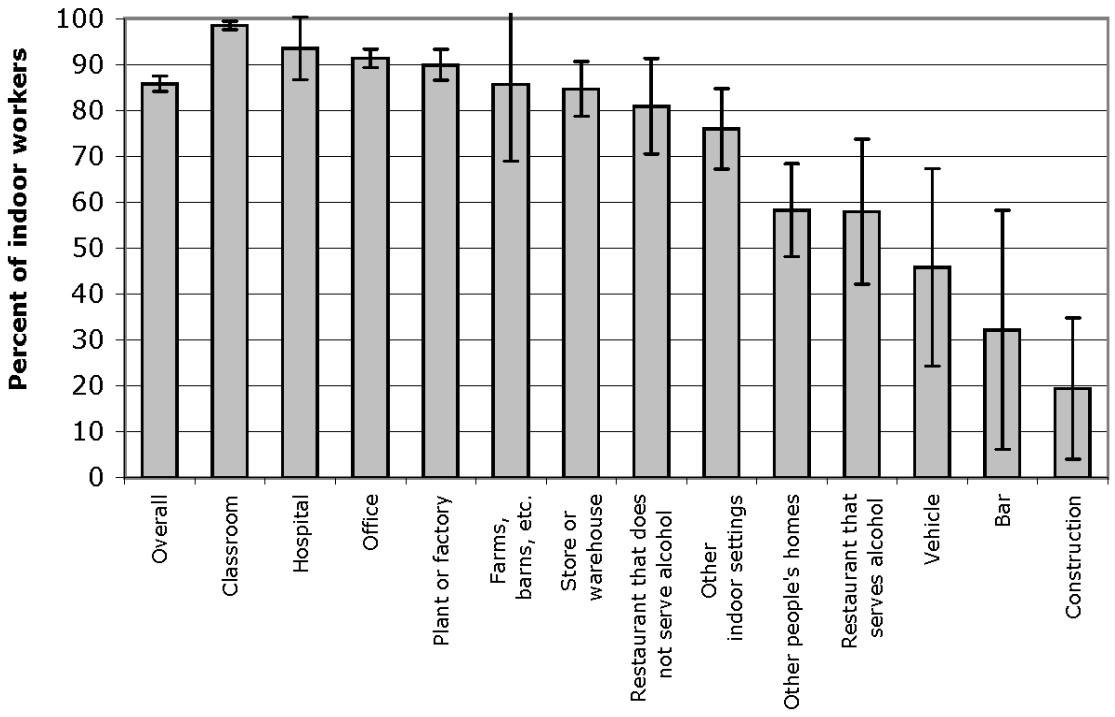
Characteristics	Smoking not allowed anywhere in these areas
	%
Overall	**76.1** ± 1.9
Age	
18 to 24	**64.3** ± 6.1
25 to 44	**76.4** ± 3.2
45 to 64	**80.3** ± 2.2
65 or older	**72.5** ± 5.9
Gender	
Female	**86.4** ± 2.0
Male	**67.4** ± 3.0
Education	
Less than high school	**55.2** ± 13.3
High school graduate/GED	**67.4** ± 4.3
Some college or technical school	**74.5** ± 3.3
College graduate or beyond	**88.4** ± 1.7
Household income	
$35,000 or less	**69.0** ± 5.2
$35,001 to $50,000	**69.9** ± 5.7
$50,001 to $75,000	**75.1** ± 3.9
$75,001 or more	**82.6** ± 2.4
Smoking status	
Current smokers	**68.0** ± 5.3
Former smokers	**78.4** ± 3.4
Never smokers	**77.7** ± 2.5

Source: Minnesota Adult Tobacco Survey, 2007

Worksite policy coverage further varies by work setting. Among those who work primarily in an indoor setting, 85.8±1.7 percent are covered by a policy prohibiting smoking in their own work areas. The highest coverage of such prohibitions occurs among those who work in classrooms (98.5±1.0 percent), hospitals (93.5±6.8 percent), or offices (91.4±2.0 percent) (Figure 4-2). The lowest coverage is among those who work in indoor construction (19.4±15.4 percent) or a bar (32.2±26.0

percent). These findings are consistent with the smoke-free policies enforced at the time of data collection. While some communities in Minnesota implemented local smoke-free policies for indoor work settings, most of the state was still operating under the 1975 Clean Indoor Air Act, which exempted bars and restaurants.

Figure 4-2. Minnesotans working in common indoor work settings who are covered by smoke-free policies in work areas



	Overall	Classroom	Hospital	Office	Plant or factory	Farms, barns, etc.	Store or warehouse	Restaurant that does not serve alcohol	Other indoor settings	Other people's homes	Restaurant that serves alcohol	Vehicle †	Bar	Construction
Percent of indoor workers	85.8±1.7	98.5±1.0	93.5±6.8	91.4±2.0	89.9±3.3	85.7±16.7	84.7±6.0	80.9±10.4	76.0±8.7	58.3±10.1	58.0±15.8	45.8±21.5	32.2±26.0	19.4±15.4

† These respondents considered their work as primarily indoor work.

Source: Minnesota Adult Tobacco Survey, 2007

There are statistically significant differences in work area policy coverage in indoor work settings among age, gender, education, and income groups, and among smoking status groups (Table 4-9). Young adults aged 18-24 (64.3±6.1 percent) are less likely to report that their workplace is smoke-free indoors than are 25-44-year-olds (76.4±3.2 percent) and 45-64-year-olds (80.3±2.2 percent). Men (67.4±3.0 percent) are less likely to report that their workplace is smoke-free indoors than

women (86.4±2.0 percent). People in the lower education groups (55.2±13.3 percent of those with less than a high school degree) are much less likely to report that their workplace is smoke-free indoors than those in higher education groups (88.4±1.7 percent of those with a college degree). And those in lower income groups (69.0±5.2 percent of those in the lowest income group) are less likely to report that their worksite is smoke-free indoors than those in higher income groups (82.6±2.5 percent of those in the highest income group).

Among those who do not work primarily indoors, work area smoking prohibitions are less common overall, covering 39.9±5.4 percent of such workers (Figure 4-3). Work area smoking prohibitions are most common for those outdoor workers who work in a vehicle (61.8±11.5 percent) or miscellaneous other outdoor workers (60.3±10.4 percent) and are least common in those outdoor workers who work in landscaping (8.8±6.7 percent) or farming (9.3±6.7 percent). The miscellaneous other category includes those who work in sales and real estate and on golf courses, among other varied outdoor jobs.

4.4.3 Smoke-free Rules at Home

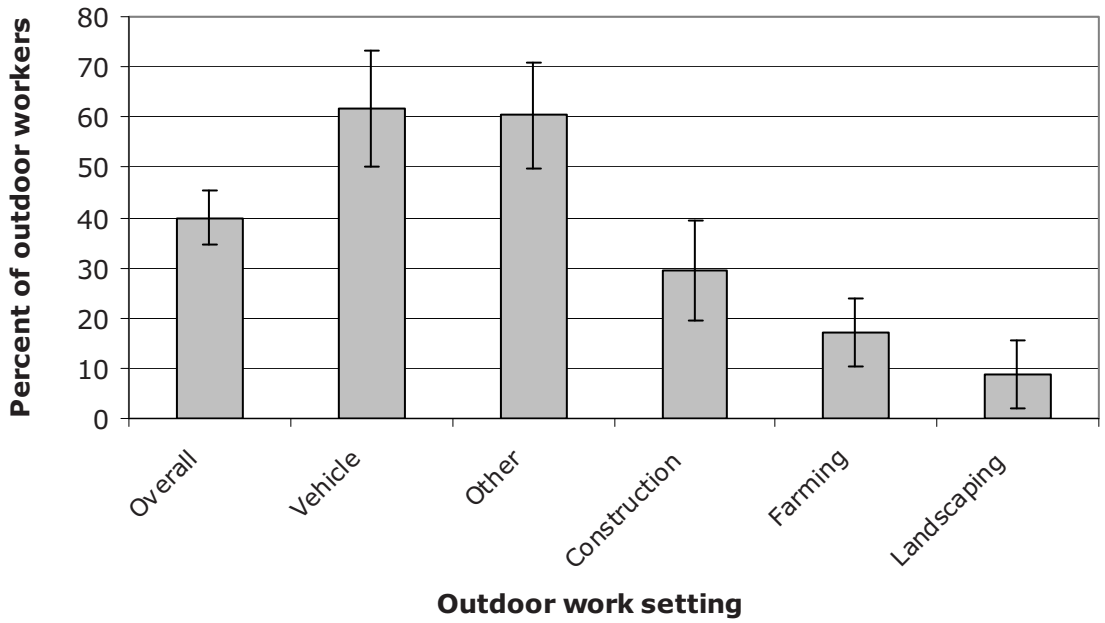
Secondhand smoke policies at home differ from secondhand smoke policies in the community or at work because homes are private. Home policies are adopted voluntarily by individuals, and rules preventing secondhand smoke exposure in the home appear to be widespread.

Smoke-free Policy at Home

Survey Question

- 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, smoking is allowed in some places or at some times, or smoking is allowed anywhere inside the home?

Figure 4-3. Minnesotans working in common outdoor work settings who are covered by smoke-free policies in work areas



	Overall	Vehicle†	Other	Construction	Farming	Landscaping
Percent of outdoor workers	39.9 ± 5.4	61.8 ± 11.5	60.3 ± 10.4	29.3 ± 9.9	17.0 ± 6.7	8.8 ± 6.7

† These respondents considered their work as primarily outdoors.

Source: Minnesota Adult Tobacco Survey, 2007

As shown in Table 4-10, 83.2±1.3 percent of Minnesotans live in homes where smoking is not allowed anywhere. There are statistically significant differences in not allowing smoking at home by age, income and smoking status. Among young adults aged 18-24, 87.5±3.1 percent live in homes where smoking is not allowed; this percentage declines as age increases, with 80.6±2.0 percent of those 65 or older living in homes where smoking is not allowed. The differences between the two oldest age groups and the youngest are statistically significant. Those with higher incomes are more likely to have smoke-free policies in their homes than those with lower incomes: 90.2±2.0 percent of those with incomes over $75,000 per year live in a home with such a policy, while 71.5±3.1 percent of those with incomes of $35,000 per year or less live in a home with such a policy. Finally, as might be expected,

never smokers (92.1±1.3 percent) are the most likely to live in homes with smoke-free policies, followed by former smokers (85.6±1.8 percent) and current smokers (49.6±4.6 percent). These differences among smoking status groups are statistically significant.

Table 4-10. Minnesotans living in homes with smoke-free rules, by selected demographic characteristics and smoking status

Characteristics	Smoking not allowed anywhere inside home
	%
Overall	**83.2** ± 1.3
Age	
18 to 24	**87.5** ± 3.1
25 to 44	**85.4** ± 2.5
45 to 64	**80.2** ± 2.0
65 or older	**80.6** ± 2.0
Gender	
Female	**83.8** ± 1.7
Male	**82.6** ± 1.9
Education	
Less than high school	**70.7** ± 6.8
High school graduate/GED	**76.1** ± 3.0
Some college or technical school	**84.2** ± 1.8
College graduate or beyond	**93.0** ± 1.1
Household income	
$35,000 or less	**71.5** ± 3.1
$35,001 to $50,000	**79.3** ± 4.2
$50,001 to $75,000	**86.0** ± 2.4
$75,001 or more	**90.2** ± 2.0
Smoking status	
Current smokers	**49.6** ± 4.6
Former smokers	**85.6** ± 1.8
Never smokers	**92.1** ± 1.3

Source: Minnesota Adult Tobacco Survey, 2007

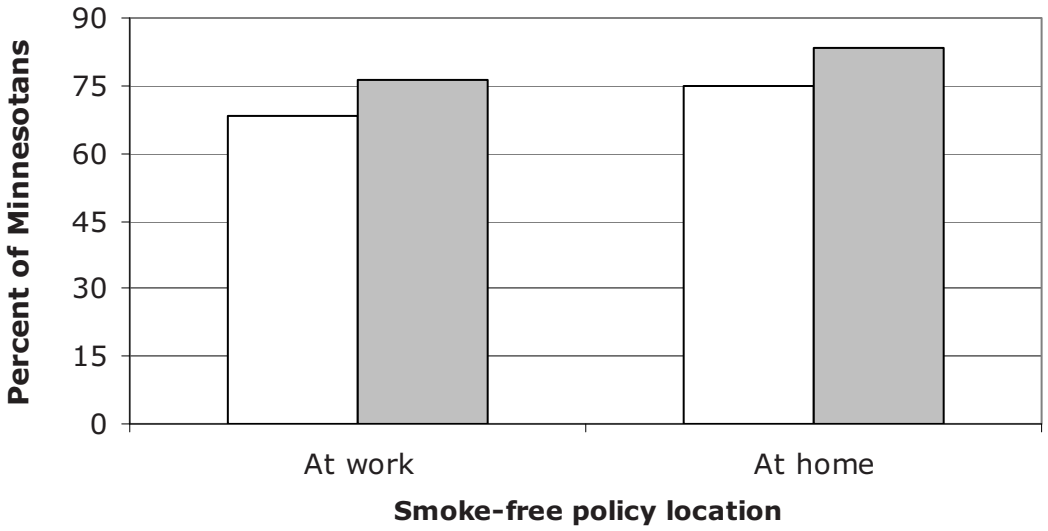
Among people with children aged 17 or younger living in their households, 88.1±1.8 percent have a rule against smoking in their homes. In contrast, among people who do not have children living in their household, 79.4±1.8 percent have a rule against smoking in their homes. The presence of children in the home is significantly associated with having a rule against smoking in the home ($p<0.05$).

4.4.4 Minnesotans Covered by Smoke-free Policies, 2003 to 2007

Most of the local bar and restaurant smoke-free ordinances have been passed since 2003, so MATS did not collect data on community policies in the 1999 or 2003 surveys. However, data were collected about workplace and home policies.

In 2007, 76.1±1.9 percent of Minnesotans said their workplace had a policy that did not permit smoking in either work areas or indoor common areas. This is a statistically significant increase of 7.7±2.8 percentage points over 2003 (Figure 4-4).

Figure 4-4. Minnesotans covered by a smoke-free policy at work† and at home, from 2003 to 2007



Year	At workplaces	At home
2003	68.4 ± 2.1	74.8 ± 1.6
2007	76.1 ± 1.9	83.2 ± 1.3
Change over time 2003 to 2007	7.7 ± 2.8 %*	8.3 ± 2.0 %*

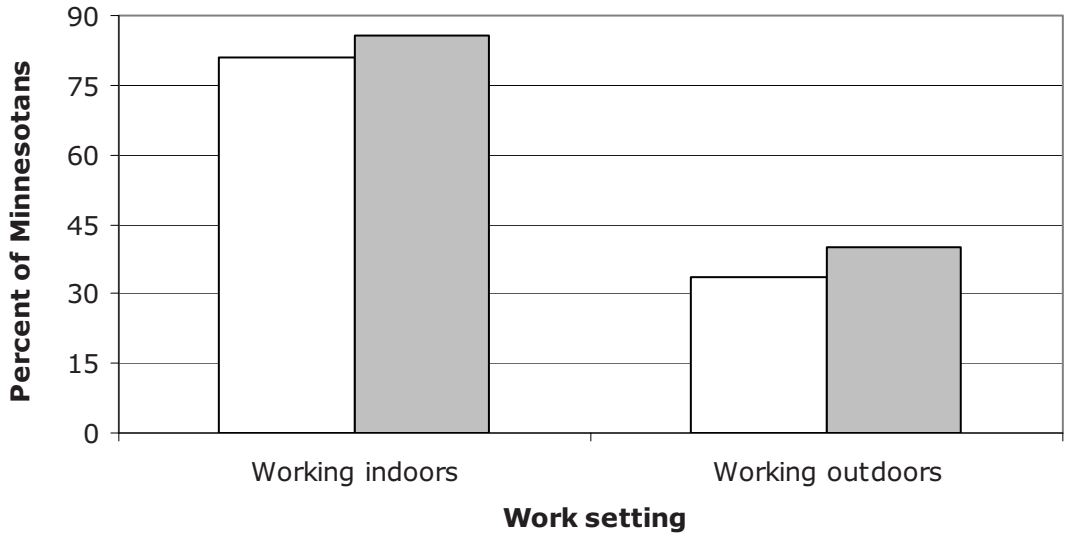
† Work areas and indoor common areas

* Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

As discussed, smoke-free policies are more common for indoor work settings than for outdoor work settings. Among those who work indoors, 85.8±1.7 percent said smoking was not allowed in their work area in 2007, a statistically significant increase of 5.1±2.4 percentage points over 2003 (Figure 4-5). Among outdoor workers, the percentage of workplace policies did not increase significantly.

Figure 4-5. Minnesotans covered by a smoke-free policy in work areas, by indoor/outdoor work setting, from 2003 to 2007



Year	Working indoors	Working outdoors
2003	80.8 ± 1.7	33.7 ± 5.3
2007	85.8 ± 1.7	39.9 ± 5.4
Change over time 2003 to 2007	5.1 ± 2.4 %*	6.1 ± 7.6 %

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

4.5 Secondhand Smoke Exposure

It is especially important to monitor Minnesotans' exposure to secondhand smoke in light of the changing policy environment that has increased their levels of protection. This section focuses on exposure to secondhand smoke in any setting, and then examines exposure in the community, at work, in a car and at home.

4.5.1 Any Exposure to Secondhand Smoke

Exposure to Secondhand Smoke in Any Setting

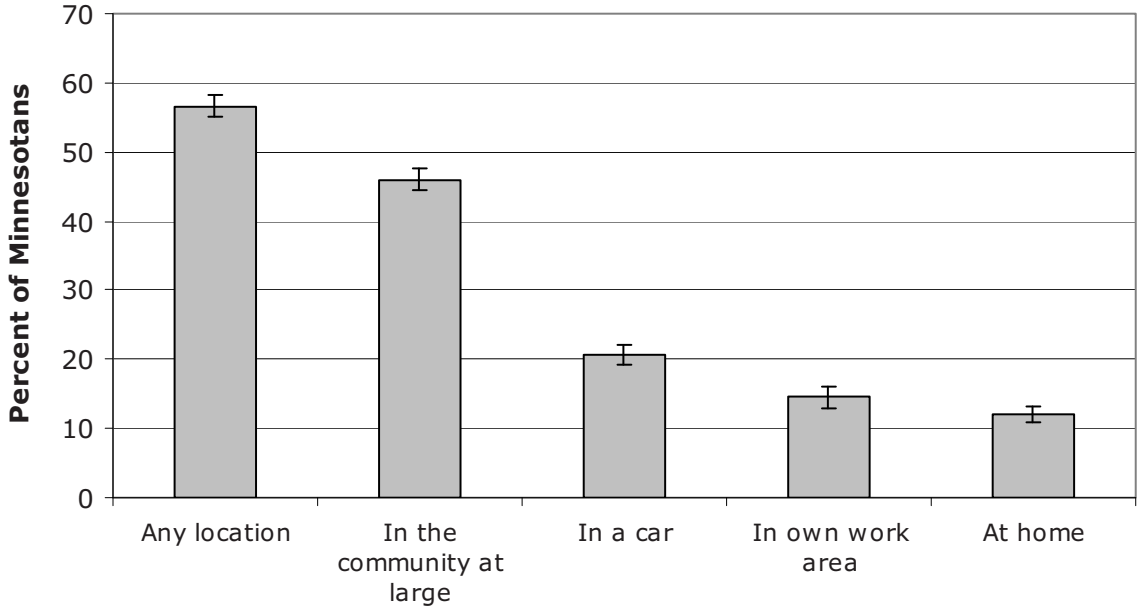
Exposure to secondhand smoke in any setting is exposure in any one or more of the following settings: in the community at large, at work, in a car or at home. For work, it encompasses any type of work setting, including indoor and outdoor settings.

Questions and definitions for each individual exposure setting (community, work, car and home) can be found in the sections below.

Over half (56.7±1.6 percent) of Minnesotans have been exposed to secondhand smoke in some location in the past seven days (Figure 4.6). There are statistically significant differences in general exposure to secondhand smoke by age, gender, education and smoking status (Table 4-11). Young adults aged 18-24 (73.2±5.1 percent), are more likely to be exposed to secondhand smoke in any location than any other age group. Similarly, men (61.0±2.4 percent) are more likely to be exposed than women (52.5±2.0 percent), and people who do not have a college degree are significantly more likely to be exposed than people who do.

Exposure to secondhand smoke varies by setting. Minnesotans are significantly more likely to be exposed to secondhand smoke in the community at large (46.0±1.6 percent) than in a car (20.6±1.4 percent), at work (14.6±1.6 percent) or at home (12.0±1.2 percent) (Figure 4-6).

Figure 4-6. Exposure of Minnesotans to secondhand smoke in the past seven days, in selected settings



	Any location	In the community at large	In a car	In own work area	At home
Percent of Minnesotans	56.7 ± 1.6	46.0 ± 1.6	20.6 ± 1.4	14.6 ± 1.6	12.0 ± 1.2

Source: Minnesota Adult Tobacco Survey, 2007

Table 4-11. Minnesotans exposed to secondhand smoke in the past seven days in various settings, by selected demographic characteristics and smoking status

Characteristics	Setting				
	At any location	At home	In own work area	In a car	In the community at large
	%	%	%	%	%
Overall	**56.7** ± 1.6	**12.0** ± 1.2	**14.6** ± 1.6	**20.6** ± 1.4	**46.0** ± 1.6
Age					
18 to 24	**73.2** ± 5.1	**12.8** ± 3.5	**23.2** ± 4.9	**41.4** ± 5.1	**58.3** ± 5.3
25 to 44	**59.9** ± 2.9	**10.4** ± 2.1	**16.3** ± 2.9	**21.6** ± 2.8	**49.4** ± 3.1
45 to 64	**54.8** ± 2.3	**15.0** ± 2.0	**9.9** ± 1.4	**17.8** ± 2.0	**43.9** ± 2.3
65 or older	**39.3** ± 2.4	**8.9** ± 1.6	**6.3** ± 2.9	**7.5** ± 1.3	**32.0** ± 2.2
Gender					
Female	**52.5** ± 2.0	**11.4** ± 1.7	**6.5** ± 1.3	**17.7** ± 1.9	**42.9** ± 2.1
Male	**61.0** ± 2.4	**12.7** ± 1.7	**21.4** ± 2.7	**23.5** ± 2.2	**49.2** ± 2.5
Education					
Less than high school	**60.6** ± 6.0	**23.8** ± 6.9	**32.5** ± 11.6	**31.1** ± 6.9	**46.0** ± 6.6
High school graduate/GED	**62.8** ± 3.0	**17.4** ± 2.6	**19.9** ± 3.8	**27.3** ± 3.0	**48.3** ± 3.3
Some college or technical school	**58.6** ± 2.9	**11.1** ± 1.6	**15.8** ± 2.8	**21.5** ± 2.4	**47.6** ± 2.9
College graduate or beyond	**46.8** ± 2.3	**4.1** ± 1.1	**5.9** ± 1.2	**9.4** ± 1.7	**41.6** ± 2.3
Household income					
$35,000 or less	**59.0** ± 3.1	**20.9** ± 2.9	**19.0** ± 4.4	**25.6** ± 3.0	**43.3** ± 3.3
$35,001 to $50,000	**59.9** ± 4.2	**17.0** ± 4.3	**18.7** ± 5.3	**25.2** ± 4.6	**50.3** ± 4.5
$50,001 to $75,000	**59.4** ± 3.5	**10.3** ± 2.2	**15.1** ± 3.2	**23.0** ± 3.3	**47.7** ± 3.7
$75,001 or more	**53.6** ± 2.8	**5.8** ± 1.5	**10.3** ± 2.0	**14.2** ± 2.1	**46.5** ± 2.7
Smoking status					
Current smokers	**91.5** ± 2.0	**46.4** ± 4.6	**28.3** ± 5.3	**68.3** ± 4.1	**67.2** ± 4.3
Former smokers	**54.7** ± 2.7	**6.7** ± 1.7	**12.9** ± 3.1	**13.2** ± 2.2	**46.6** ± 2.8
Never smokers	**47.2** ± 2.1	**4.2** ± 0.9	**11.1** ± 1.8	**9.8** ± 1.3	**39.4** ± 2.0

Note: Smoking reported at home or in work areas could refer to smoker's own smoking, as well as that of others. If report referred only to smoker, this does not represent the person's exposure to secondhand smoke. True secondhand smoke exposure may be somewhat lower than presented for home and work areas.

Source: Minnesota Adult Tobacco Survey, 2007

4.5.2 Secondhand Smoke Exposure in the Community

Exposure to Secondhand Smoke in the Community

Exposure in the community at large includes exposure in any setting other than work, car or home.

Survey Question

- In Minnesota, in the past seven days, has anyone smoked near you at any place besides your home, workplace or car?

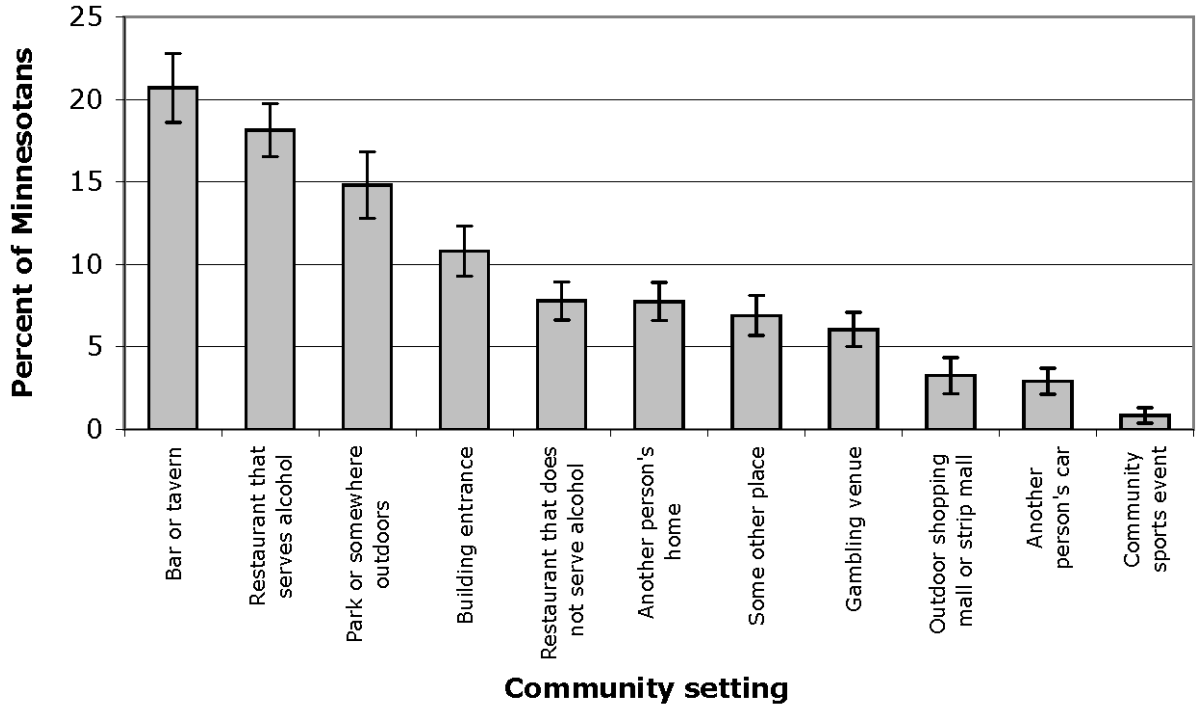
  If Yes:

- The last time this happened, in Minnesota, where were you? Were you at... a restaurant that does not serve alcohol, a restaurant that serves alcohol, a bar or tavern, a park or somewhere outdoors, a building entrance, an outdoor shopping mall or strip mall, a community sports event, a gambling venue, another person's home, another person's car, or some other place?

Close to half (46.0±1.6 percent) of Minnesotans have been exposed to secondhand smoke in their community in the past seven days (Table 4-11). There are significant differences in community exposure among age and gender groups. Young adults (58.3±5.3 percent), are more likely to be exposed to secondhand smoke in the community than any other age group. Similarly, men (49.2±2.5 percent) are more likely to be exposed to secondhand smoke in the community than women (42.9±2.1 percent).

The most commonly reported location for community exposure to secondhand smoke is a bar or tavern (20.7±2.1 percent), followed by a restaurant that serves alcohol (18.1±1.6 percent), a park or somewhere outdoors (14.8±2.0 percent) and a building entrance (10.8±1.5 percent) (Figure 4-7).

Figure 4-7. Most recent exposure of Minnesotans to secondhand smoke in community settings, by type of setting



	Bar or tavern	Restaurant that serves alcohol	Park or somewhere outdoors	Building entrance	Restaurant that does not serve alcohol	Another person's home	Some other place	Gambling venue	Outdoor shopping mall or strip mall	Another person's car	Community sports event
Percent of Minnesotans	20.7 ± 2.1	18.1 ± 1.6	14.8 ± 2.0	10.8 ± 1.5	7.8 ± 1.2	7.8 ± 1.1	6.9 ± 1.2	6.1 ± 1.0	3.3 ± 1.1	2.9 ± 0.8	0.9 ± 0.5

Source: Minnesota Adult Tobacco Survey, 2007

4.5.3 Secondhand Smoke Exposure at Work

Exposure to Secondhand Smoke at Work

MATS collects information about people's exposure to secondhand smoke in a variety of settings, including at work. For exposure at work, MATS also collects information about whether people are indoor or outdoor workers and whether they work at home. All analyses of exposure to secondhand smoke at work are limited to Minnesotans who are employed away from their home.

Exposure at Work

Survey Questions

- As far as you know, in the past seven days, has anyone smoked in your work area?

In order to further classify work settings as indoor or outdoor, and to identify people who work at home:

- While working at your job, are you indoors most of the time?
- What best describes where you work for money? Would you say it is a classroom, a hospital, an office, your home, other people's homes, a plant or factory, a store or warehouse, a restaurant that does not serve alcohol, a restaurant that serves alcohol, a bar, a vehicle, or some other setting?

Interpreting the Data

MATS did not specifically determine if anyone other than the smoker (including the respondent) was present when the smoking occurred. As a result, the actual immediate secondhand smoke exposure rates in work areas may be slightly lower than presented in this report.

Among all Minnesotans who are employed, 14.6±1.6 percent are exposed to secondhand smoke at work (Table 4-11). There are significant differences in exposure to secondhand smoke at work by age, gender, education and income. Young adults are more likely to be exposed to secondhand smoke (23.2±4.9 percent) at work compared with all three older age groups. Men (21.4±2.7 percent) are much more likely to be exposed than women (6.5±1.3 percent). Exposure at work decreases markedly as educational level increases, declining from 32.5±11.6 percent of those with less than a high school degree to 5.9±1.2 percent of those with a college degree. Those with household incomes of $35,000 or less (19.0±4.4 percent)

or $35,001 to $50,000 (18.7±5.3 percent) are more likely to be exposed to secondhand smoke at work than the highest income group (10.3±2.0 percent).

4.5.4 Secondhand Smoke Exposure in a Car

Exposure to Secondhand Smoke in Cars

Survey Question

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

About 20 percent (20.6±1.4 percent) of Minnesotans were exposed to secondhand smoke in the past seven days in a car (Table 4-11). There are significant differences in exposure to secondhand smoke in a car by age, gender, education and income. Young adults aged 18-24 (41.4±5.1 percent) are about twice as likely to be exposed to secondhand smoke as 25-44-year-olds (21.6±2.8 percent) or 45-64-year-olds (17.8±2.0 percent). Women (17.7±1.9 percent) are less likely to be exposed than men (23.5±2.2 percent). There is a sharp, statistically significant drop-off in exposure to secondhand smoke in a car as education level increases. Among those people who do not have a college degree, between 21 percent and 31 percent were exposed to secondhand smoke in a car, while among those who have a college degree, only 9.4±1.7 percent were exposed. Similarly, about one-quarter of people in the lower income levels were exposed to secondhand smoke in a car, while there is a statistically significant drop-off among those with household incomes of more than $75,000, 14.2±2.1 percent of whom were exposed to secondhand smoke in a car.

4.5.5 Secondhand Smoke Exposure at Home

Children in the Home and Exposure to Secondhand Smoke

Survey Questions

- How many children living in your household are…
  - Younger than 5 years old?
  - 5 through 11 years old?
  - 12 through 17 years old?
- During the past seven days, how many days did anyone smoke cigarettes, cigars, or pipes anywhere inside your home?

Interpreting the Data

MATS did not specifically determine if anyone other than the smoker (including the respondent) was present when the smoking occurred. As a result, the actual immediate secondhand smoke exposure rates in the home may be slightly lower than presented in this report.

Among all Minnesotans, 12.0±1.2 percent say that someone has smoked cigarettes inside their home in the past seven days (Table 4-11). There are statistically significant differences in smoking in the home by education, income and smoking status. People with less than a high school degree (23.8±6.9 percent) and people with a high school degree (17.4±2.6 percent) are much more likely to say that someone has smoked in their home than people with more education. Similarly, people with lower incomes are more likely to say that someone has smoked in their home than people with higher incomes. Current smokers (46.4±4.6 percent) are much more likely to say someone has smoked in their home in the past seven days than former smokers (6.7±1.7 percent) and never smokers (4.2±0.9 percent). There are no statistically significant differences in smoking in the home by age or gender.

A large number of Minnesota's children live in homes where secondhand smoke is sometimes present. Among people with children living in their households, 9.6±1.7 percent say that someone has smoked in their home in the past seven days. This means that, in a given week, someone smoked in the homes of around 155,000 adults who have one or more children in the home.

4.5.6 Secondhand Smoke Exposure, 2003 to 2007

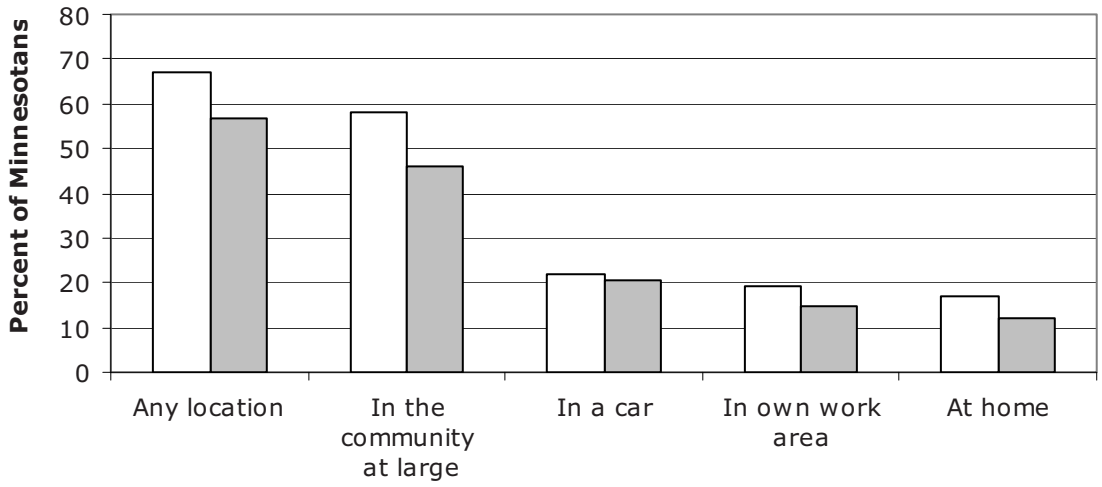
The questions about secondhand smoke exposure in the community were changed slightly in 2007. In 2007, MATS asked a general question about secondhand smoke exposure in any place other than work, car or home. In 2003, MATS asked about exposure in any place other than work or home. These questions measure community secondhand smoke exposure and are also a part of the measure of any secondhand smoke exposure, so interpreting changes in these measures from 2003 and 2007 must be done with caution. Due to the change in question wording, the magnitude of change in exposure may be underestimated.

Between 2003 and 2007, there was a large and significant decrease in the percentage of Minnesotans exposed to secondhand smoke in any location (Figure 4-8). In 2003, 67.2±1.7 percent of Minnesotans reported being exposed to secondhand smoke in the past seven days. This declined by 10.6±2.3 percentage points, to 56.7±1.6 percent in 2007. There were statistically significant declines for every subgroup except current smokers (Table 4-12). The largest declines were among college graduates (13.2±3.7 percentage points), men (12.4±3.3 percentage points), and never smokers (12.2±3.3 percentage points).

The largest decline in exposure to secondhand smoke in a specific setting was in community exposure (Figure 4-8). In 2003, 58.0±1.8 percent of Minnesotans were exposed to secondhand smoke in the community in the past seven days, while in 2007 community exposure declined to 46.0±1.6 percent of Minnesotans. This is a statistically significant change.

Exposure to secondhand smoke declined by about 5 percentage points for both home (4.9±1.8 percentage points) and work (4.5±2.5 percentage points). Both of these declines are statistically significant. Exposure to secondhand smoke in a car did not decline.

Figure 4-8. Exposure of Minnesotans to secondhand smoke in the past seven days in selected settings, from 2003 to 2007



Year	Any location	In the community at large	In a car	In own work area	At home
2003	67.2 ± 1.7	58.0 ± 1.8	21.7 ± 1.7	19.0 ± 1.9	16.9 ± 1.4
2007	56.7 ± 1.6	46.0 ± 1.6	20.6 ± 1.4	14.6 ± 1.6	12.0 ± 1.2
Change over time 2003 to 2007	-10.6 ± 2.3 %*	-12.0 ± 2.4 %*	-1.2 ± 2.2 %	-4.5 ± 2.5 %*	-4.9 ± 1.8 %*

Note: In 2007, MATS asked a general question about secondhand smoke exposure in any place other than work, car or home. In 2003, MATS asked about exposure in any place other than work or home. These questions are the MATS measure of community secondhand smoke exposure, and are also components of the MATS overall measure of secondhand smoke exposure in any location, so interpreting changes in these measures from 2003 and 2007 must be done with caution.

* Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

Table 4-12. Minnesotans exposed to secondhand smoke in the past seven days in any location, by selected demographic characteristics and smoking status, from 2003 to 2007

Characteristics	2003	2007	Change over time 2003 to 2007
	%	%	%
Overall	**67.2** ± 1.7	**56.7** ± 1.6	**-10.6** ± 2.3 *
Age			
18 to 24	**81.7** ± 3.7	**73.2** ± 5.1	**-8.4** ± 6.3 *
25 to 44	**72.3** ± 2.8	**59.9** ± 2.9	**-12.4** ± 4.1 *
45 to 64	**65.1** ± 3.1	**54.8** ± 2.3	**-10.3** ± 3.8 *
65 or older	**46.5** ± 3.4	**39.3** ± 2.4	**-7.2** ± 4.1 *
Gender			
Female	**61.3** ± 2.4	**52.5** ± 2.0	**-8.8** ± 3.1 *
Male	**73.4** ± 2.3	**61.0** ± 2.4	**-12.4** ± 3.3 *
Education			
Less than high school	**64.8** ± 7.0	**60.6** ± 6.0	**-4.2** ± 9.2
High school graduate/GED	**72.5** ± 2.9	**62.8** ± 3.0	**-9.7** ± 4.2 *
Some college or technical school	**69.0** ± 3.0	**58.6** ± 2.9	**-10.4** ± 4.2 *
College graduate or beyond	**59.9** ± 2.9	**46.8** ± 2.3	**-13.2** ± 3.7 *
Smoking status			
Current smokers	**93.8** ± 1.7	**91.5** ± 2.0	**-2.3** ± 2.6
Former smokers	**64.1** ± 2.7	**54.7** ± 2.7	**-9.4** ± 3.8 *
Never smokers	**59.4** ± 2.6	**47.2** ± 2.1	**-12.2** ± 3.3 *

*Statistically significant at the 95% confidence level

Note: In 2007, MATS asked a general question about secondhand smoke exposure in any place other than work, car or home. In 2003, MATS asked about exposure in any place other than work or home. These questions are components of the MATS overall measure of secondhand smoke in any location, so interpreting changes in these measures from 2003 and 2007 must be done with caution.

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

4.6 Smoke-free Policies and Their Association with Exposure to Secondhand Smoke at Work and at Home

This section looks at the intersection of policy and secondhand smoke exposure to illustrate the impact policy has on reducing exposure in each setting.

4.6.1 Smoke-free Policies in the Workplace and Their Association with Workplace Exposure

Minnesotans with policies that do not allow smoking at work face less exposure to secondhand smoke in their work area than those without such policies. Among Minnesotans who report that smoking is not allowed in work areas, 5.4±1.2 percent had someone smoke in their work area in the past seven days (Table 4-13). By comparison, nearly 10 times as many of those who report that smoking is allowed in work areas (49.4±5.0 percent) had someone smoke in their work area ($p<0.05$).

Table 4-13. Minnesotans exposed to secondhand smoke in the past seven days in own work area, by the presence or absence of a smoke-free policy for work areas

Smoke-free policy for work areas	7-day exposure to secondhand smoke in own work area		
	Yes	No	Row total
	%	%	%
Yes	**5.4** ± 1.2	**94.6** ± 1.2	**100**
No	**49.4** ± 5.0	**50.6** ± 5.0	**100**

Source: Minnesota Adult Tobacco Survey, 2007

4.6.2 Smoke-free Rules in the Home and Their Association with Home Exposure

Minnesotans living in homes with rules that do not allow smoking face less exposure to secondhand smoke than those living in homes without such rules. Among those with such a rule, only 1.6±0.5 percent report that someone has smoked in their home in the past seven days (Table 4-14). In contrast, among Minnesotans who do not have such a rule, 64.4±3.9 percent say that someone has smoked in their home in the past seven days ($p<0.05$).

Table 4-14. Minnesotans exposed to secondhand smoke inside the home in the past seven days, by the presence or absence of a smoke-free rule inside the home

Smoke-free policy inside home	7-day exposure to secondhand smoke inside home		
	Yes	No	Row total
	%	%	%
Yes	**1.6** ± 0.5	**98.4** ± 0.5	**100**
No	**64.4** ± 3.9	**35.6** ± 3.9	**100**

Source: Minnesota Adult Tobacco Survey, 2007

4.7 Key Findings

Some of the most important findings from this chapter are summarized below. All differences presented in this summary are statistically significant at the 0.05 confidence level unless otherwise noted.

Key Secondhand Smoke Findings for 2007

- Nearly all Minnesotans (93.0±0.8 percent) agree that secondhand smoke is very or somewhat harmful to health. There is similarly high agreement with its relationship to specific diseases, except for a somewhat lower concurrence with its relationship to SIDS.
- Almost 60 percent (59.9±1.6 percent) of Minnesotans say that a restriction on smoking in workplaces, including restaurants and bars, is very important, and an additional 20.4±1.4 percent say that it is somewhat important.
- Most Minnesotans (80.0±1.8 percent) express a preference to work where smoking is not allowed. Almost none prefer to work where it is allowed; even among smokers, only 8.6±3.2 percent express such a preference.
- Over three times as many Minnesotans do or would go out more (23.4±1.2 percent) than go out less (7.0±0.9 percent) because of a smoke-free policy that applies to restaurants and bars.

- As of Dec. 31, 2006, there were clean indoor air ordinances prohibiting smoking in restaurants and/or bars in 15 Minnesota cities and counties. Nearly 40 percent (38.1±1.5 percent) of Minnesotans, as estimated from the survey sample, live in these communities.

- Over three-quarters (76.1±1.9 percent) of Minnesotans work where smoking is not allowed inside the workplace. Coverage by such workplace policies seems to generally increase with educational and income level.

- More than 80 percent (83.2±1.3 percent) of Minnesotans live in homes where smoking is not allowed. Smoke-free home policies are associated with increasing educational level and with the non-smoking status of the individual.

- Over half (56.7±1.6 percent) of Minnesotans have been exposed to secondhand smoke in some location in the past seven days. Young adults are significantly more likely to be exposed than any other group.

- Almost 15 percent (14.6±1.6 percent) of Minnesotans have been exposed to secondhand smoke in their work area in the past seven days. Young adults, men and those with less than a high school education are most likely to be exposed in this setting.

- About 20 percent (20.6±1.4 percent) of Minnesotans have been exposed to secondhand smoke in a car in the past seven days. Young adults are by far the most likely to be exposed in a car (41.4±5.1 percent). Those with less than a high school education appear more likely to be exposed in a car.

- About 12 percent (12.0±1.2 percent) of Minnesotans say that someone has smoked cigarettes inside their home in the past seven days. Those with less than a high school education appear more likely to have had someone smoke inside their home.

- The existence of smoke-free policies in the workplace and the home is associated with freedom from exposure to secondhand smoke in these settings. Where smoke-free policies exist for work areas, 94.6±1.2 percent of workers had no one smoke in their work area in the past seven days. Similarly, where there is a smoke-free policy in the home, 98.4±0.5 percent of the individuals report that no one smoked in the home in the past seven days.

Key Secondhand Smoke Findings for 2003 to 2007

- Between 2003 and 2007, the percentage of Minnesotans who believe that secondhand smoke is very or somewhat harmful increased from 90.9±1.2 percent to 93.0±0.8 percent, an increase of 2.2±1.4 percentage points. While only 67.3±2.0 percent of the population is aware of its relationship to SIDS, this is an increase of nearly 14.9±3.3 percentage points since 2003.

- Between 2003 and 2007, the percentage of Minnesotans who would prefer to work in a place where smoking is not allowed indoors increased by 5.1 percentage points, from 75.0±1.9 percent in 2003 to 80.0±1.8 percent in 2007.

- Between 2003 and 2007, the percentage of Minnesotans who would go out more because of a smoke-free ordinance in restaurants and bars increased by 7.3±1.9 percentage points.

- In 2007, 76.1±1.9 percent of Minnesotans said their workplace had a policy that did not permit smoking in either work areas or indoor common areas. This is an increase of 7.7±2.8 percentage points over 2003 (68.4±2.1 percent).

- In 2007, about 83.2±1.3 percent of Minnesotans lived in a home where smoking was not permitted, an increase of 8.3±2.0 percentage points over 2003 (74.8±1.6 percent).

- In 2003, 67.2±1.7 percent of Minnesotans were exposed to secondhand smoke in the past seven days. This declined by over 10 percentage points (10.6±2.3), to 56.7±1.6 percent in 2007. The largest declines, in excess of 12 percentage points, occurred among men, college graduates and never smokers.

- A large decline of 12.0±2.4 percentage points occurred between 2003 and 2007 for those exposed in the community at large, dropping to less than half of Minnesotans (46.0±1.6 percent).

- Between 2003 and 2007, the percentage of Minnesotans who said someone smoked inside their home in the past seven days declined by 4.9±1.8 percentage points, from 16.9±1.4 percent in 2003 to 12.0±1.2 percent in 2007.

4.8 Discussion

Media campaigns and other strategies employed by Minnesota's comprehensive tobacco control program to educate the public about the dangers of secondhand smoke, along with accelerated momentum for the passage of local smoke-free policies, have helped produce tremendous changes in public attitudes and perceptions since MATS 2003. There has been a statistically significant increase over time in awareness of the harm of secondhand smoke, with an overwhelming majority of Minnesotans now aware of many of the previously less-recognized dangers associated with secondhand smoke: respiratory problems in children and SIDS. There has been a similar increase in support for smoke-free policies among Minnesotans. These changing attitudes mark an important shift in social norms, with overall decreasing public acceptability of secondhand smoke exposure. Furthermore, ClearWay Minnesota studies examining the economic impact of local smoke-free policies in Minnesota found that these policies caused no apparent economic harm to hospitality businesses, and suggested a robust economic environment in which Minnesotans go out to eat and drink as much as before.[4] MATS 2007 confirmed these findings and is consistent with the substantial body of scientific evidence that has shown that smoke-free policies have a neutral or positive economic impact on communities.[5]

These important shifts in attitudes and perceptions coincided with growing local support for smoke-free workplaces. Minnesota's tobacco control organizations provided resources to local communities to help create and maintain smoke-free environments. As a result, between the 2003 and 2007 MATS, there was a dramatic increase in the number of Minnesota communities that adopted local smoke-free ordinances, with 4 out of every 10 Minnesotans living in a community with smoke-free workplaces at the time of MATS 2007 data collection. During this same period, statistically significant declines in the public's exposure to secondhand smoke are seen. These declines in exposure appear not only in workplace settings but in Minnesotans' homes and the community at large as well. It appears that as smoking becomes less acceptable as a result of smoke-free policies in public domains such as workplaces, the acceptability of smoking in private spheres, such as homes, changes as well. The results of MATS 2007 confirm the benefit of smoke-free policy

adoption: reduced exposure to secondhand smoke, which will result in the improved health of Minnesotans living in those communities.

Further declines in secondhand smoke exposure are expected in future MATS following the passage of the statewide smoke-free law in 2007. Over the long term, reduced exposure to secondhand smoke will lead to less disease, fewer deaths and reduced health care costs for Minnesotans.

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5. Smoking among Young Adults in Minnesota

5.1 Introduction

Young adults (18-24-year-olds) are one of the most critical population groups in the fight to reduce the preventable disease and premature death caused by tobacco use. They are a transitional group between adolescence, when most smokers start to smoke, and the middle and later adult years, when smoking becomes on average more intense (in terms of cigarettes per day) and entrenched. Young adults are also heavily marketed to by the tobacco industry.

The percentage of young adults who are current smokers in Minnesota is the highest of any adult age group. Among young adults, smoking prevalence based on the standard adult definition is 21.5±4.4 percent, compared with 16.4±1.5 percent of adults 25 years old or older, as previously discussed in chapter 2. High smoking rates are not the only important finding. The place of tobacco use in the lives of many young adults is unsettled and changing. Many young adult smokers are in transition from experimental to occasional to daily smoking. Others are increasing the number of cigarettes they smoke per day. Still others, perhaps not as many, are cutting back and quitting.[1]

The tobacco industry understands that the major life changes and stresses occurring during these years—leaving home, going to college, working low-paying jobs, dealing with relationships, and so forth—offer great opportunities to promote its products. It counts on new smokers and those who are already smoking to increase their use of tobacco to boost the volume of cigarettes sold now and for many years to come. As one researcher for the industry noted, "…the ten years following the teenage years is the period during which average daily consumption per smoker increases to the average adult level."[2] There is much at stake for the industry.

Since Minnesota's 1998 tobacco lawsuit settlement closed off most direct advertising aimed at teens, the industry has expanded and diversified promotions aimed at young adults. The industry organizes promotional events at bars and clubs,

sponsors music concerts, and gives away tobacco products and merchandise as part of a strategy to link smoking with fun and relaxation.[3] Special coupons and price-cutting offers have been shown to be successful in reaching young adults and other population groups sensitive to costs.[4]

To counter the industry's strategy, Clearway Minnesota, Blue Cross and their partners have developed and implemented new approaches to encourage quitting and prevent initiation. These include edgy, creative, humorous media campaigns designed to debunk the mistaken assumptions, which young smokers on college campuses may have, that quitting is easy and can be put off for years. ClearWay Minnesota and Blue Cross have also funded the Healthy Campus Tobacco Free Network and other campus tobacco control efforts with colleges.

Currently, an increasing number of colleges and universities are establishing smoke-free policies in dormitories and in areas outside of campus buildings. At least five campuses in Minnesota are entirely smoke-free.[5] Nearly 70 post-secondary schools are coordinating efforts to reduce tobacco use and secondhand smoke exposure through the Healthy Campus Tobacco Free Network.

Efforts to prevent smoking initiation by adolescents also can contribute to reduced smoking later on by young adults. Using funding from the state's 1998 settlement with the tobacco industry, MDH launched the Minnesota Youth Tobacco Prevention Initiative (MYTPI) in 2000. MYTPI was a comprehensive mix of activities that included the Target Market ad campaign and youth organizing movement, grants to school-based and community-based prevention programs, and tougher enforcement of laws restricting youth access to tobacco. In 2004, MYTPI was replaced by the Tobacco-Free Communities grants program, which supports local work to reduce youth exposure to tobacco influences and to create tobacco-free environments. These efforts have contributed to deep reductions in teen smoking.[6] As a result, fewer teens are now entering their young adult years as smokers.

Beginning in the next section, this chapter will use a different definition of smoking status than has been used in previous chapters. This alternative definition is more

sensitive to smoking behavior by less-established users and provides greater insight into young adult smokers.

Even using the standard adult definition of current smoking, as in chapters 2-4, there are many differences between younger and older smokers. Table A-1 in appendix A presents key findings about smoking and quitting by age similar to those findings in chapters 2 and 3. Young adult smokers average 10.7±1.8 cigarettes per day compared with 14.4±0.9 per day for older smokers (over the past 30 days). Young adult smokers also are somewhat less likely to be addicted. Social factors play a much larger role in the smoking lives of young adults. Compared with older smokers, young adult smokers are much more likely to have given a cigarette to a friend in the past month, to smoke more when they are drinking and to smoke mainly when they are with other people. Table A-1 also suggests that young adult smokers are more in need of education and assistance when it comes to quitting. Young adult smokers who tried to quit in the past 12 months are far less likely than older smokers to use any form of assistance in their quit attempts. Most of them believe they can quit without medication, while less than half of older smokers hold this belief. Young adult smokers are both less likely to have seen a doctor in the past 12 months and less likely to have been advised to stop smoking by the doctors they did see.

Table A-2 in appendix A summarizes findings from chapter 4 about secondhand smoke by age. Young adults are more likely to be exposed to secondhand smoke than older adults, especially at work, in a car, or in the community at large. Young adults are less likely to be covered by smoke-free policies at work, but are also less likely to view such policies as very important. While the confidence intervals sometimes do not support the statistical significance of each of these observed differences, the picture that emerges from appendix A is that younger adult smokers, while not smoking quite as heavily as their older counterparts, are for the most part vulnerable to further tobacco addiction.

This chapter focuses on key findings for young adults drawn from all the major subject areas of the survey. Section 5.2 explains the definition of current smoking that is used in this chapter and other measurement issues. The remaining sections examine smoking and overall tobacco use prevalence, characteristics of smokers,

the social context of smoking, attempts to quit smoking, and exposure to and policies regarding secondhand smoke. Comparisons with findings from the 2003 survey are presented where relevant. (The 1999 survey did not oversample young adults.)

Even though young adults were oversampled in the 2007 survey, analysis of subgroups within that population can result in large confidence intervals. This is true, for example, during analysis of young adult smokers and more so for analysis of young adult smokers who have tried to quit. In these cases, differences that seem reasonably large still may not reach statistical significance. In this chapter, findings that are close to being statistically significant are sometimes reported because such findings could have reached significance with a larger sample.

5.2 Measuring Smoking among Young Adults

To provide the most complete picture of smoking among young adults, a current smoker in this chapter is defined as any young adult who has smoked cigarettes in the past 30 days, regardless of whether they have smoked 100 cigarettes in their lifetime. The standard definition of adult smoking used to report overall adult smoking rates in chapter 2 excludes some people who have smoked at least one cigarette in the past 30 days, because of the 100-cigarette requirement. This excluded group is particularly large among young adults.

As presented in chapter 2, MATS 2007 found that 21.5±4.4 percent of young adults are current smokers according to the standard adult definition. Nearly all of these (21.3±4.3 percent) also smoked in the past 30 days (Figure 5-1). There are an additional 7.1±2.7 percent who smoked in the past 30 days but do not meet the standard adult criteria for being a current smoker. Adding this group of unrecognized smokers results in an overall smoking prevalence rate for young adults of 28.4±4.8 percent under the 30-day definition that is the focus of this chapter.

Smoking Status for Young Adults

Established Smokers

An established smoker in this chapter is a young adult who has smoked at least 100 cigarettes in his or her lifetime and now smokes every day or some days.

An established smoker is identical to a current smoker as defined in section 2.2.1 and discussed throughout chapters 2-4. This is the same definition used by the CDC and by most adult smoking studies to define current smokers.[7]

Unrecognized Smokers

An unrecognized smoker has smoked a cigarette in the past 30 days, but is not counted as a current smoker by the established smoker definition described above. The great majority of unrecognized smokers identified by MATS report that they have smoked fewer than 100 cigarettes in their lifetime. In much smaller numbers, unrecognized smokers also include those who have smoked 100 or more cigarettes, who said they now smoke "not at all," but who *also* said they have smoked in the past 30 days.

Using the criterion of any smoking in the previous 30 days reveals a group of young adults who are smoking and may be on the path to established smoking but who remain unseen when using the traditional definition of a current adult smoker. This group is often understudied; therefore MATS describes these young adults as unrecognized smokers.

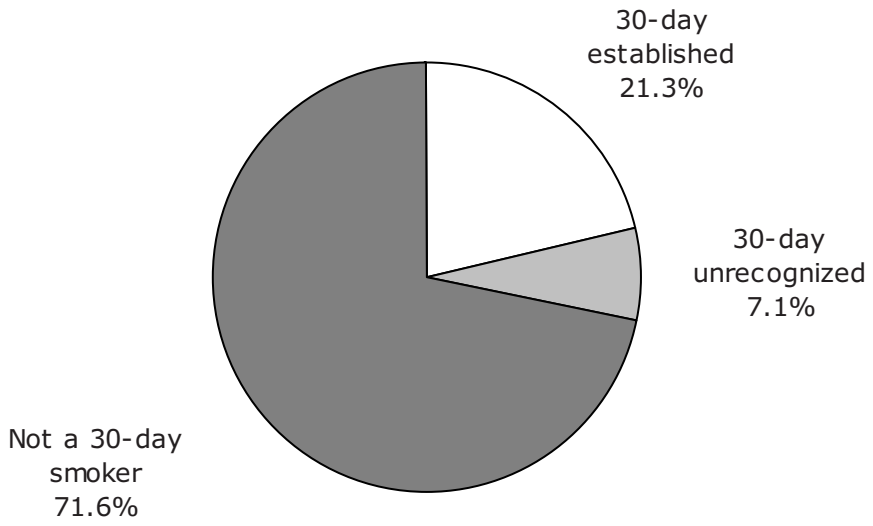
Thirty-day Smokers

A 30-day smoker smokes every day or has smoked on at least one day out of the past 30 days. No accounting is made of how many cigarettes a person has smoked in his or her lifetime. All unrecognized smokers are 30-day smokers. Most (but not all) established smokers are also 30-day smokers.

Survey Questions

- Have you smoked at least 100 cigarettes in your entire life?
- Do you now smoke cigarettes every day, some days or not at all?
- During the past 30 days, on how many days did you smoke cigarettes?

Figure 5-1. Thirty-day smoking status of young adults, 2007



Source: Minnesota Adult Tobacco Survey, 2007

As Table 5-1 shows, the existence of substantial numbers of unrecognized smokers is primarily an issue for young adults and not for older age groups: while over 7 percent of young adults can be classified as unrecognized smokers, less than 1 percent of every other age group falls into this designation. This further demonstrates the rationale for applying this broader definition specifically to young adults.

Table 5-1. Age distribution of 30-day established and unrecognized smokers

Age groups	30-day established	30-day unrecognized	Total
	%	%	%
18 to 24	**21.3** ± 4.3	**7.1** ± 2.7	**28.4** ± 4.8
25 to 44	**19.2** ± 2.7	**0.9** ± 0.6	**20.1** ± 2.7
45 to 64	**17.4** ± 2.0	**0.6** ± 0.5	**18.0** ± 2.0
65 or older	**5.8** ± 1.3	**0.5** ± 0.5	**6.3** ± 1.4

Source: Minnesota Adult Tobacco Survey, 2007

Unrecognized smokers differ from more established smokers in many ways. They report smoking infrequently, do not consider themselves to be smokers, show few or no signs of addiction, and started smoking at a later age on average. Nevertheless, anyone who is currently smoking, even if occasionally, is at much greater risk than a nonsmoker of moving into regular and addictive smoking. (Table A-3 in appendix A presents a number of the key differences for young adults between traditionally defined established smokers and unrecognized smokers.)

This chapter examines percentages by gender and also by college enrollment status instead of the educational level subgroups discussed in chapters 2-4. Many young adults may not have completed their education. As shown in chapter 2, completion of a college degree is associated with lower smoking prevalence. However, young adults might either be in college or have recently graduated. Consequently, MATS has created an educational measure that is based on college enrollment or completion status.

College Status

MATS 2007 divides young adults into those who are on a post-secondary degree track and those who are not. The former group, or "the college group," includes those who already have a four-year college degree and those who are currently enrolled in college or technical school at any level. The latter group, or "the non-college group," includes those who are not enrolled in any school and who have not earned a four-year college degree; it may include some who have previously been enrolled in a post-secondary educational institution without completing a degree.

Survey Questions

- What is the highest level of school you completed?
- Are you currently seeking a degree, certification, or license in a four-year college, a two-year college, a technical school, high school, or GED program?

  If yes:
- What type of degree, certification or license is that?

Because the income information collected in MATS is household income, not personal income, the income statistics for young adults may not be as reflective of established economic status as for older adults. A higher income may reflect parental income and not the young adult's when the individual is still living at home; alternately, lower income may be purely a function of living alone as a student or holding an entry-level job soon after college graduation. Assigning further interpretation to the young adults' household income level is hindered by these issues and has not been done in this report.

5.3 Young Adult Tobacco Use

This section looks at tobacco use among young adults from several perspectives. The main focus is on cigarette smoking because the majority of tobacco users are cigarette smokers. However, as shown in section 2.2, young adults are more likely to use other forms of tobacco than are older adults, so young adult use of other forms of tobacco is also examined here. The section ends with a discussion of trends in young adult tobacco use since 2003.

5.3.1 Young Adult Use of Cigarettes

As noted previously, 28.4±4.8 percent of young adult Minnesotans smoked one or more cigarettes in the previous 30 days. The prevalence of smoking among young adult men (33.3±7.2 percent) is higher than for women (23.1±6.1 percent), although this difference is not statistically significant (Table 5-2), consistent with the pattern reported in chapter 2. The inclusion of unrecognized smokers increases the smoking prevalence considerably more for men (an additional 9.8±4.9 percent) than for women (an additional 4.1±2.0 percent).

Among all young adults, 23.0±6.1 percent of the college group are smokers, while 41.1±9.6 percent of the non-college group are smokers. This difference is both large and statistically significant. Notably, the inclusion of unrecognized smokers has more effect on the smoking prevalence for the college group than on the non-college group, adding 8.0±4.1 percent to the former and only 4.5±3.0 percent to the latter.

Table 5-2. Thirty-day smoking status among young adults, by selected demographic characteristics

Characteristic	30-Day Established	30-Day Unrecognized	Total
	%	%	%
Gender			
Female	**19.0** ± 5.9	**4.1** ± 2.0	**23.1** ± 6.1
Male	**23.5** ± 6.4	**9.8** ± 4.9	**33.3** ± 7.2
College status			
Enrolled or graduated	**15.0** ± 5.1	**8.0** ± 4.1	**23.0** ± 6.1
Neither enrolled nor graduated	**36.6** ± 9.5	**4.5** ± 3.0	**41.1** ± 9.6

Source: Minnesota Adult Tobacco Survey, 2007

5.3.2 Young Adult Use of Non-Cigarette Tobacco Products: Pipes, Cigars, Smokeless Tobacco and Hookah

Use of Non-Cigarette Tobacco Products among Young Adults

In 2007, 9.2±3.5 percent of young adults in Minnesota were current users of one or more non-cigarette tobacco products (Table 5-3). (This section uses the same definitions of non-cigarette tobacco products and use of the individual products as specified in section 2.2.2.) Seventeen percent (17.1±6.3 percent) of men use some non-cigarette form of tobacco, while less than 1 percent (0.8±0.7 percent) of women do, a large, statistically significant difference. College status is not associated with use of non-cigarette tobacco.

Table 5-3. Current use of tobacco products among young adults, by selected demographic characteristics

Population	Any tobacco use, including cigarettes	Any non-cigarette tobacco use	Pipe use	Cigar use	Smokeless tobacco use	Hookah use
	%	%	%	%	%	%
All Minnesota young adults	**32.9** ± 5.1	**9.2** ± 3.5	**1.4** ± 2.2	**4.5** ± 2.3	**4.3** ± 1.9	**2.9** ± 1.8
Gender						
Female	**23.5** ± 6.1	**0.8** ± 0.7	**0.0** ± 0.0	**0.6** ± 0.7	**0.1** ± 0.1	**1.8** ± 2.4
Male	**41.6** ± 7.6	**17.1** ± 6.3	**2.8** ± 4.2	**8.1** ± 4.3	**8.3** ± 3.6	**3.9** ± 2.6
College status						
Enrolled or graduated	**27.2** ± 6.6	**9.4** ± 5.1	**2.4** ± 3.8	**5.1** ± 3.5	**2.7** ± 1.5	**3.7** ± 2.7
Neither enrolled nor graduated	**46.3** ± 9.9	**7.4** ± 4.9	**0.0** ± 0.0	**1.9** ± 2.0	**6.4** ± 4.8	**1.8** ± 2.2

Source: Minnesota Adult Tobacco Survey, 2007

Young adults use pipes, cigars and smokeless tobacco at very low rates. Overall, 4.5±2.3 percent of them smoke cigars. Most young adult cigar smokers are men (8.1±4.3 percent). The prevalence of smokeless tobacco use is also fairly low at 4.3±1.9 percent, nearly all of it represented by men (8.3±3.6 percent). Less than 2 percent (1.4±2.2 percent) of young adults currently smoke tobacco in pipes and essentially all of them are men (2.8±4.2 percent).

As noted in chapter 2, hookah smoking and hookah lounges have increased in popularity in the United States, particularly near college campuses. While less than half of 1 percent (0.4±0.2 percent) of the overall Minnesota population are current hookah users, 2.9±1.8 percent of young adults currently use hookahs, a statistically significant difference. Hookah use did not differ by gender and college status.

Young Adult Use of All Forms of Tobacco Products

Another way of looking at the prevalence of tobacco use is to consider how many people use it in any form. This measure provides a clear picture of the pervasiveness of tobacco use among young adult Minnesotans.

Over 30 percent (32.9±5.1 percent) of young adults currently use some form of tobacco (Table 5-3), including cigarettes, pipes, cigars, smokeless or other forms; 28.4±4.8 percent of young adults are current cigarette smokers. Only 4.5 percent of young adults use tobacco exclusively in non-cigarette forms. Therefore, nearly all young adult tobacco users (86.4±7.8 percent) currently smoke cigarettes, demonstrating why tobacco control organizations focus on young adult cigarette use.

Because cigarette smokers constitute the largest percentage of all young adult tobacco users in Minnesota, the demographic patterns for use of any tobacco product are similar to those already presented for current cigarette smoking. Men (41.6±7.6 percent) are more likely to use some form of tobacco than women (23.5±6.1 percent), and those in the non-college group (46.3±9.9 percent) are more likely to use some form of tobacco than those in the college group (27.2±6.6 percent). These differences are statistically significant.

Use of Non-Cigarette Tobacco Forms among Young Adult Cigarette Smokers

The use of non-cigarette tobacco products is typically more common among cigarette smokers than nonsmokers. Among young adult smokers, 16.8±7.6 percent also use some other form of tobacco, which is about double the percentage among all young adults (Table 5-4). Among young male smokers, 26.4±11.8 percent use another form of tobacco, while only a small percentage of young female smokers (1.8±1.6 percent) do. Over 20 percent (22.7±13.9 percent) of the college group of smokers use at least one other form of tobacco, while only 5.4±2.6 percent of the non-college smokers do so, a large and statistically significant difference.

Table 5-4. Non-cigarette tobacco use among young adult current smokers, by selected demographic characteristics

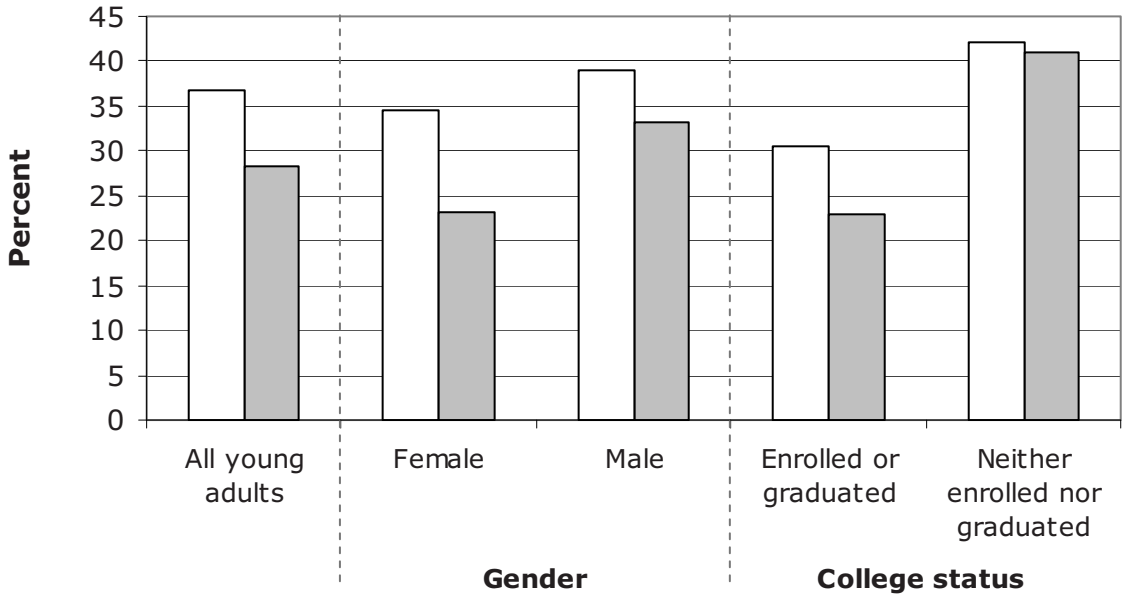
Characteristics	Any non-cigarette tobacco use
	%
Overall	**16.8** ± 7.6
Gender	
Female	**1.8** ± 1.6
Male	**26.4** ± 11.8
College status	
Enrolled or graduated	**22.7** ± 13.9
Neither enrolled nor graduated	**5.4** ± 2.6

Source: Minnesota Adult Tobacco Survey, 2007

5.3.3 Young Adult Tobacco Use, 2003 to 2007

Overall young adult smoking in Minnesota declined significantly by 8.4±6.5 percentage points, from 36.8±4.3 percent in 2003 to 28.4±4.8 percent in 2007 (Figure 5-2). This is a remarkable degree of change in just four years, and it means that the estimated number of young adult smokers fell from 169,000 in 2003 to 127,000 in 2007. The decline was statistically significant for women (11.3±8.3 percentage points) but not for men (5.8±9.8 percentage points).

Figure 5-2. Prevalence of young adult 30-day smoking, by selected demographic characteristics, from 2003 to 2007



Year	All young adults	Female	Male	Enrolled or graduated	Neither enrolled nor graduated
2003	36.8 ± 4.3	34.4 ± 5.6	39.0 ± 6.6	30.5 ± 5.7	42.1 ± 7.7
2007	28.4 ± 4.8	23.1 ± 6.1	33.3 ± 7.2	23.0 ± 6.1	41.1 ± 9.6
Change over time 2003 to 2007	-8.4 ± 6.5 %*	-11.3 ± 8.3 %*	-5.8 ± 9.8 %	-7.5 ± 8.3 %	-1.0 ± 12.3 %

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

Smoking prevalence fell from 30.5±5.7 percent to 23.0±6.1 percent among the college group, but that decline was not statistically significant. The smoking prevalence for the non-college group showed no change; in 2003 42.1±7.7 percent smoked, and in 2007 41.1±9.6 percent smoked.

Use of any tobacco product among young adults did decline, although not significantly, from 38.9±4.4 percent in 2003 to 32.9±5.1 percent in 2007.

5.4 Characteristics of Young Adult Smokers

Section 2.3 of chapter 2 examined several personal, tobacco use, and social characteristics of Minnesota smokers. This section reviews a selection of these same characteristics of young adult smokers. They include ages of smoking onset and regular smoking, smoking intensity, and addiction. Additionally, self-perception as a smoker is addressed for young adult smokers. Perceptions of harm, the social environment of smoking and trends since 2003 are also included.

5.4.1 Individual Health and Behavioral Characteristics of Young Adult Smokers

As discussed in section 2.3.2, the age when an individual first tries a cigarette and the age when he or she becomes a regular smoker are important to understanding how people take up smoking and become addicted to nicotine. Tracking the change in these two measures over time provides the tobacco control community with information necessary to target prevention programs and identify factors that may affect the age of smoking uptake in the population at large. Because prevention and cessation interventions may be even more critical for young adult smokers, who may not yet be fully addicted, these measures may be even more informative. This section uses concepts and definitions as explained and specified in section 2.3.

Age of Initiation and Regular Smoking

Nearly one in five (19.0±7.7 percent) young adult smokers first tried a cigarette at or after age 18 (Table 5-5). There are no statistically significant differences by gender or college status.

Table 5-5. Age of smoking initiation among young adult 30-day smokers, by selected demographic characteristics

Characteristics	Age of initiation				
	11 years old and younger	12-14 years old	15-17 years old	18 years and older	Row total
	%	%	%	%	%
Overall	**11.2** ± 7.4	**40.4** ± 10.0	**29.4** ± 8.6	**19.0** ± 7.7	**100**
Gender					
Female	**6.7** ± 6.5	**46.0** ± 14.9	**24.1** ± 13.2	**23.2** ± 13.7	**100**
Male	**14.0** ± 11.2	**36.9** ± 13.4	**32.7** ± 11.5	**16.3** ± 9.0	**100**
College status					
Enrolled or graduated	**8.2** ± 12.9	**39.0** ± 15.6	**30.0** ± 12.0	**22.8** ± 12.7	**100**
Neither enrolled nor graduated	**5.8** ± 4.3	**49.7** ± 14.8	**26.3** ± 14.2	**18.1** ± 11.2	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Slightly more than one-third (34.5±9.7 percent) of young adult smokers became regular smokers at or after age 18 (Table 5-6). There are no statistically significant differences in becoming a regular smoker at or after age 18 by gender or college status. More than 18 percent (18.5±8.1 percent) of young adult smokers say they have never smoked regularly. However, there is a large and important difference by college status. The college group (30.4±14.9 percent) is far more likely to say that they have never smoked regularly than the non-college group (4.1±2.7 percent).

Table 5-6. Age of becoming a regular smoker among young adult 30-day smokers, by selected demographic characteristics

Characteristics	Age of regular smoking				
	11 years old and younger	12-14 years old	15-17 years old	18 years and older	Never smoked regularly
	%	%	%	%	%
Overall	**0.6** ± 1.3	**13.1** ± 7.8	**33.3** ± 9.0	**34.5** ± 9.7	**18.5** ± 8.1
Gender					
Female	**0.0** ± 0.0	**16.0** ± 10.7	**27.6** ± 11.6	**40.8** ± 16.0	**15.6** ± 8.4
Male	**1.1** ± 2.1	**11.2** ± 11.0	**37.1** ± 12.7	**30.4** ± 11.4	**20.3** ± 12.2
College Status					
Enrolled or graduated	**0.0** ± 0.0	**9.3** ± 12.8	**28.1** ± 12.9	**32.2** ± 13.7	**30.4** ± 14.9
Neither enrolled nor graduated	**1.5** ± 3.0	**13.0** ± 9.8	**37.2** ± 14.2	**44.2** ± 15.7	**4.1** ± 2.7

Source: Minnesota Adult Tobacco Survey, 2007

Smoking Frequency

This section introduces the concept of "smoking frequency," a measure of smoking behavior that has not been previously discussed.

Young adult smokers tend to the extremes in terms of the number of days they have smoked out of the past 30 days. Overall, 63.1±9.5 percent of young adult smokers smoked on every day of the past 30 days (Table 5-7). Approximately 25 percent smoked on five days or less, including 13.9±7.7 percent who smoked on only one day. College status shows large and statistically significant differences. Nearly half (48.4±15.4 percent) of the college group smoked all 30 days, while 80.0±10.1 percent of the non-college group did so. While nearly a quarter (24.4±14.7 percent) of the college group smoked on only one day, only 3.8±2.6 percent of the non-college group did so.

Smoking Frequency

Smoking frequency refers to the relative proportion of days on which someone smokes, usually expressed as the number of days out of the past 30 days. Like number of cigarettes smoked per day and time to first cigarette after waking, smoking frequency provides some indication of a smoker's level of addiction. Unlike the other two measures, though, it has another, more behavioral or social, dimension. Lower smoking frequency may be indicative of smoking in certain situations, such as when socializing or drinking, on weekends, or when away from parents.

In this chapter, MATS uses the definition of occasional and frequent smoking used by the CDC for adolescent smoking studies.[8]

- A **frequent smoker** has smoked on 20 or more days out of the past 30 days. Someone who smokes every day is assumed to have smoked on 30 of the past 30 days.
- An **occasional smoker** has smoked on 1-19 days out of the past 30 days.

Survey Questions

- Do you now smoke cigarettes every day, some days or not at all?
- During the past 30 days, on how many days did you smoke cigarettes?

Table 5-7. Number of days smoked in the past 30 among young adult 30-day smokers, by selected demographic characteristics

Characteristics	1 day	2-5 days	6-9 days	10-19 days	20-29 days	30 days	Row total
	%	%	%	%	%	%	%
Overall	13.9 ± 7.7	11.0 ± 5.5	4.1 ± 3.4	3.1 ± 2.2	4.8 ± 4.5	63.1 ± 9.5	100
Gender							
Female	9.9 ± 6.3	12.6 ± 9.6	3.8 ± 4.6	1.7 ± 1.3	2.0 ± 1.3	70.0 ± 12.2	100
Male	16.5 ± 11.8	10.0 ± 6.5	4.3 ± 4.7	4.0 ± 3.6	6.6 ± 7.3	58.6 ± 13.2	100
College status							
Enrolled or graduated	24.4 ± 14.7	11.2 ± 6.9	5.2 ± 5.4	2.3 ± 1.3	8.6 ± 9.3	48.4 ± 15.4	100
Neither enrolled nor graduated	3.8 ± 2.6	9.4 ± 9.0	1.2 ± 1.1	3.9 ± 4.8	1.7 ± 1.4	80.0 ± 10.1	100

Source: Minnesota Adult Tobacco Survey, 2007

Among young adult smokers, 67.9±9.2 percent are frequent smokers (Table 5-8). There is little difference by gender. The large difference by college status approaches statistical significance, with 57.0±15.2 percent of the college group being frequent smokers and 81.7±9.9 percent of the non-college group smoking frequently. The rest of section 5.4 will also examine the characteristics of young adult smokers by smoking frequency.

Table 5-8. Smoking frequency among young adult 30-day smokers, by selected demographic characteristics

Characteristics	Frequent: 20 or more days	Occasional: 1-19 days	Row total
	%	%	%
Overall	**67.9** ± 9.2	**32.1** ± 9.2	**100**
Gender			
Female	**72.0** ± 12.1	**28.0** ± 12.1	**100**
Male	**65.2** ± 12.9	**34.8** ± 12.9	**100**
College status			
Enrolled or graduated	**57.0** ± 15.2	**43.0** ± 15.2	**100**
Neither enrolled nor graduated	**81.7** ± 9.9	**18.3** ± 9.9	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Smoking Intensity

Smoking intensity, the number of cigarettes that a person smokes in a day, measures direct exposure to cigarette toxins and the individual's approximate level of addiction to cigarettes. Young adult smokers are more likely to smoke intermittently than older smokers, so MATS included a measure of smoking

intensity that relies on the number of cigarettes smoked *on the days that the respondent smoked*.

Cigarettes per Day on Days Smoked

To calculate the number of cigarettes that a person smokes per day on days smoked, MATS focuses on smoking behavior in the 30 days immediately preceding the date the person completed the survey.

Survey Questions

For everyday smokers, ask:

- On average, about how may cigarettes per day do you smoke?

For those who have ever tried smoking but are not everyday smokers, ask:

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

Young adult smokers smoke an average of 8.4±1.5 cigarettes per day on the days that they smoked in the past 30 days (Table 5-9). Women and men did not differ on this measure. Those in the college group smoke a mean of 5.3±1.2 cigarettes per day and those in the non-college group smoke 12.4±2.5 cigarettes per day, a statistically significant difference.

Time to First Cigarette after Waking

As discussed in section 2.3.2, the typical length of time between waking and smoking the first cigarette is an indicator of the level of nicotine addiction. Among young adult smokers, 29.2±9.8 percent smoke their first cigarette of the day within 30 minutes of waking (Table 5-10). Most young adult smokers (70.8±9.8 percent) wait at least 30 minutes before lighting their first cigarette. This indicates that many young adult smokers may not yet be severely addicted and suggests an opportunity for stop-smoking campaigns and treatment methods targeted at young adult smokers.

Table 5-9. Mean number of cigarettes smoked per day (on the days smoked) by young adult 30-day smokers, by selected demographic characteristics and smoking frequency

Characteristics	Mean number of cigarettes smoked per day
Overall	**8.4** ± 1.5
Gender	
Female	**8.8** ± 2.3
Male	**8.1** ± 2.0
College status	
Enrolled or graduated	**5.3** ± 1.2
Neither enrolled nor graduated	**12.4** ± 2.5
Smoking frequency	
Frequent smoker	**11.5** ± 1.9
Occasional smoker	**1.8** ± 0.4

Source: Minnesota Adult Tobacco Survey, 2007

Table 5-10. Time to first cigarette after waking among young adult 30-day smokers, by selected demographic characteristics and smoking frequency

Characteristics	30 minutes or less	31 minutes or more	Row total
	%	%	%
Overall	**29.2** ± 9.8	**70.8** ± 9.8	**100**
Gender			
Female	**29.2** ± 14.6	**70.8** ± 14.6	**100**
Male	**29.2** ± 13.2	**70.8** ± 13.2	**100**
College status			
Enrolled or graduated	**18.3** ± 14.7	**81.7** ± 14.7	**100**
Neither enrolled nor graduated	**39.3** ± 15.0	**60.7** ± 15.0	**100**
Smoking Frequency			
Frequent smoker	**40.8** ± 12.6	**59.2** ± 12.6	**100**
Occasional smoker	**4.6** ± 7.6	**95.4** ± 7.6	**100**

Source: Minnesota Adult Tobacco Survey, 2007

While there are no statistically significant differences by gender or college status, the noticeable difference in the point estimates between the college (81.7±14.7 percent) and non-college (60.7±15.0 percent) groups in waiting at least 30 minutes to smoke their first cigarette suggests that further research could find real differences between these subgroups.

In contrast, the difference between frequent and occasional smokers is large and statistically significant. Almost all occasional smokers (95.4±7.6 percent) have their first cigarette at least 30 minutes after waking, while only 59.2±12.6 percent of frequent smokers wait that long. Perhaps more telling, nearly all of the occasional smokers (94.7±7.6 percent) light their first cigarette at least 60 minutes after waking, compared with 35.6±11.3 percent of the frequent smokers who wait that long.

The combination of smoking intensity and time to first cigarette shows that the non-college group and the frequent smokers have the higher percentages on both addiction measures compared with the college group and the occasional smokers, respectively.

Self-Perception as a Smoker

Self-Perception as a Smoker

Survey Question

- Do you consider yourself a smoker?

MATS asks respondents if they consider themselves to be smokers. Current smokers who do not think of themselves as smokers may feel they are not at risk for smoking-related disease and may dismiss anti-tobacco messages. Among all young adult smokers, 28.9±8.9 percent do not consider themselves smokers (Table 5-11). The college group (40.9±15.1 percent) is more likely than the non-college group (17.0±9.5 percent) to not consider themselves as smokers, a large but not statistically significant difference. In addition, nearly all (98.0±2.6 percent) frequent smokers consider themselves to be smokers, compared with only 14.3±11.2 percent of occasional smokers.

Table 5-11. Self-identification as a smoker among young adult 30-day smokers, by selected demographic characteristics and smoking frequency

Characteristics	Considers self a smoker	Does not consider self a smoker	Row total
	%	%	%
Overall	**71.2** ± 8.9	**28.9** ± 8.9	**100**
Gender			
Female	**71.8** ± 12.3	**28.2** ± 12.3	**100**
Male	**70.7** ± 12.4	**29.3** ± 12.4	**100**
College status			
Enrolled or graduated	**59.1** ± 15.1	**40.9** ± 15.1	**100**
Neither enrolled nor graduated	**83.1** ± 9.5	**17.0** ± 9.5	**100**
Smoking frequency			
Frequent smoker	**98.0** ± 2.6	**2.0** ± 2.6	**100**
Occasional smoker	**14.3** ± 11.2	**85.7** ± 11.2	**100**

Source: Minnesota Adult Tobacco Survey, 2007

5.4.2 Individual-level Influences on Smoking Behavior: Perceptions of Harm among Young Adults

Smokers tend to differ from nonsmokers in their knowledge of and attitudes related to tobacco use. MATS focuses on the perceived harmfulness of various forms of tobacco use, such as various types of cigarettes and smokeless tobacco. This section focuses on the perceptions of harm among Minnesota's young adult nonsmokers and young adult smokers. This section uses concepts and definitions described in section 2.3.3.

Perceptions of Harm

Perceptions of harm are important indicators of an individual's potential to experiment with tobacco use, motivation to quit and support for tobacco control policies. This section first examines the perceived harmfulness of occasional cigarette smoking and then examines the perceived harmfulness of using other tobacco products *relative* to smoking regular cigarettes. For both forms of perceived harmfulness, the section examines differences in perception by smoking status and demographic groups.

Assuming that most people would agree that heavy smoking is harmful, MATS does not ask about this issue. However, young adults may not view occasional cigarette smoking as harmful. MATS tracks the perceived harmfulness of occasional smoking because it indicates the extent to which Minnesotans understand the dangers of smoking.

About 70 percent (71.8±4.8 percent) of young adults agree that smoking an occasional cigarette is harmful (Table 5-12). The perceived harmfulness of occasional smoking is higher among those young adults who do not smoke (79.5±-5.3 percent) than among those who do smoke (52.4±9.9 percent). This statistically significant relationship suggests that smokers hold beliefs that may either have led to their smoking initiation or reinforce their current behavior. There are no statistically significant differences in the perceptions of the harm in occasional smoking by gender or college enrollment.

Table 5-12. Perceived harmfulness of smoking an occasional cigarette among young adults, by selected demographic characteristics, smoking frequency and 30-day smoking status

Characteristics	Perceived harmful
	%
Overall	**71.8** ± 4.8
Gender	
Female	**77.0** ± 6.3
Male	**66.8** ± 7.2
College status	
Enrolled or graduated	**74.8** ± 6.1
Neither enrolled nor graduated	**63.7** ± 9.9
Smoking frequency	
Frequent smoker	**55.9** ± 12.0
Occasional smoker	**45.2** ± 16.3
30-day smoking status	
Has smoked in the past 30 days	**52.4** ± 9.9
Has not smoked in the past 30 days	**79.5** ± 5.3

Source: Minnesota Adult Tobacco Survey, 2007

The tobacco industry markets non-cigarettes and alternative cigarette products as safer than cigarettes, although no form of tobacco use has been shown to be safe. Much of this marketing is targeted (directly and indirectly) at young adults.[9] As discussed in chapter 2, the scientific community generally agrees that light or ultra-

light cigarettes, "natural" cigarettes and roll-your-own cigarettes are as harmful as cigarettes.[10] The field is more mixed on the level of harmfulness of hookah[11] and smokeless tobacco,[12] although both have been shown to be harmful to health. MATS monitors perceptions of the relative harm of using other tobacco products because people who would never smoke cigarettes might be willing to try these various other forms of tobacco products, and current users of these other forms of tobacco might be less interested in quitting.

Between 9 percent and 15 percent of young adult Minnesotans perceive other tobacco products as less harmful than cigarettes, depending on the tobacco product in question (Table 5-13).

Table 5-13. Perception by young adults of other tobacco products as less harmful than cigarettes, by selected demographic characteristics, smoking frequency and 30-day smoking status

Characteristics	Hookah: less harmful	Smokeless tobacco: less harmful	Light/ultra-light cigarettes: less harmful	Natural cigarettes: less harmful	Roll-your-own cigarettes: less harmful
	%	%	%	%	%
Overall	**11.3** ± 3.7	**9.1** ± 3.1	**11.7** ± 3.8	**15.2** ± 4.1	**5.1** ± 2.3
Gender					
Female	**8.1** ± 3.9	**4.9** ± 3.2	**12.9** ± 5.7	**12.5** ± 5.4	**3.0** ± 2.1
Male	**14.2** ± 6.0	**13.0** ± 5.1	**10.6** ± 4.9	**17.6** ± 6.2	**7.1** ± 3.9
College status					
Enrolled or graduated	**16.1** ± 5.8	**8.5** ± 3.7	**13.4** ± 5.5	**17.5** ± 5.9	**5.9** ± 3.1
Neither enrolled nor graduated	**3.1** ± 2.8	**9.7** ± 6.5	**9.2** ± 5.9	**12.4** ± 6.5	**4.6** ± 4.8
Smoking frequency					
Frequent smoker	**11.3** ± 8.7	**15.6** ± 10.1	**11.2** ± 9.3	**20.8** ± 10.4	**9.2** ± 7.5
Occasional smoker	**17.2** ± 11.0	**12.5** ± 12.7	**32.6** ± 19.5	**34.2** ± 19.9	**10.9** ± 11.8
30-day smoking status					
Has smoked in the past 30 days	**13.1** ± 6.9	**14.7** ± 8.0	**18.0** ± 9.5	**25.1** ± 10.0	**9.7** ± 6.3
Has not smoked in the past 30 days	**10.6** ± 4.4	**6.9** ± 2.8	**9.2** ± 3.5	**11.3** ± 4.0	**3.3** ± 1.9

Source: Minnesota Adult Tobacco Survey, 2007

Although the differences are not statistically significant, there is a distinct pattern by smoking status across all the alternative types of cigarettes. Young adult smokers are more likely to think that light or ultra-light cigarettes (18.0±9.5 percent), "natural" cigarettes (25.1±10.0 percent), and roll-your-own cigarettes (9.7±6.3 percent) are less harmful than cigarettes, compared with young adult nonsmokers. These findings imply that smokers are either less informed or less receptive to messages about the danger of these products relative to regular cigarettes.

For hookah, there is a statistically significant difference by college enrollment. Among the non-college group, 3.1±2.8 percent think smoking tobacco in a hookah is less harmful than smoking a cigarette, compared with 16.1±5.8 percent of the college group (Table 5-13). This difference may reflect the presence of hookah smoking bars near colleges and universities.

5.4.3 Social Environment of Smoking among Young Adults

This section looks at the social environment of smoking among young adults in Minnesota. The social environment—consisting of one's family, friends and/or coworkers, and incorporating perceptions of one's community—is a major influence on individual behavior. Social environments can support smoking behaviors in a number of ways, including increasing opportunities to smoke, increasing the number of friends and family members who model smoking behavior as positive, encouraging the perception that smoking is the social norm, and increasing the availability of cigarettes. To describe the social environment of smoking, MATS measures *both* the social context that surrounds current smokers, which is often different from the social context of former or never smokers, and the social interactions that accompany the act of smoking itself. This cross-sectional analysis cannot assert a causal relationship between these measures and smoking. Still, the results inform how to effectively intervene on smoking and track the effectiveness over time of such interventions in the social environment. See section 2.3.4 for a description of the survey questions and definitions used below.

Social Context of Smoking

MATS measures the social context of smokers by asking about living with other smokers and having close friends or family members who smoke. Living with a smoker lends social support for one's own smoking by supporting the idea that smoking is normal and by creating a context where smoking is acceptable. Similarly, friends and family members who smoke provide social support for smoking.

Nearly 30 percent (28.6±4.8 percent) of young adult Minnesotans live with a smoker (Table 5-14). Those young adults who have smoked in the last 30 days are more likely to live with a smoker (59.5±9.3 percent) than those who have not smoked in

the past 30 days (16.3±4.1 percent). In addition, frequent smokers (72.0±10.0 percent) are over two times as likely to live with a smoker as occasional smokers (33.0±18.7 percent). These statistically significant relationships demonstrate the likely role of the home environment in supporting smoking. The non-college group (39.0±9.6 percent) is more likely than the college group (24.1±6.2 percent) to live with a smoker; this difference borders on statistical significance.

Table 5-14. Living with a smoker among young adults, by selected demographic characteristics, smoking frequency and 30-day smoking status

Characteristics	Live with smoker(s)
	%
Overall	**28.6** ± 4.8
Gender	
Female	**29.2** ± 6.5
Male	**27.9** ± 7.0
College status	
Enrolled or graduated	**24.1** ± 6.2
Neither enrolled nor graduated	**39.0** ± 9.6
Smoking frequency	
Frequent smoker	**72.0** ± 10.0
Occasional smoker	**33.0** ± 18.7
30-day smoking status	
Has smoked in the past 30 days	**59.5** ± 9.3
Has not smoked in the past 30 days	**16.3** ± 4.1

Source: Minnesota Adult Tobacco Survey, 2007

Nearly 20 percent (17.6±3.9 percent) of young adults in Minnesota report that at least half of the people close to them use tobacco (Table 5-15). Young adult smokers (40.9±9.9 percent) are more likely to say that at least half the people close to them use tobacco than nonsmokers (8.4±2.8 percent). In addition, young adults who are frequent smokers (55.4±12.1 percent) are more likely to say that at least half of their intimates smoke than young adults who are occasional smokers (10.0±8.1 percent). These statistically significant differences may reveal the effect of social support in initiating or maintaining smoking.

Table 5-15. Number of people close to the individual who use tobacco products, among young adults, by selected demographic characteristics, smoking frequency and 30-day smoking status

Characteristics	None	A few	Less than half	About half or more	Row total
	%	%	%	%	%
Overall	**33.3** ± 4.9	**42.2** ± 5.3	**7.0** ± 2.5	**17.6** ± 3.9	**100**
Gender					
Female	**31.1** ± 6.6	**42.6** ± 7.3	**7.2** ± 3.8	**19.1** ± 5.5	**100**
Male	**35.3** ± 7.3	**41.8** ± 7.6	**6.7** ± 3.3	**16.2** ± 5.6	**100**
College status					
Enrolled or graduated	**39.8** ± 6.8	**40.1** ± 6.7	**5.9** ± 2.3	**14.3** ± 5.1	**100**
Neither enrolled nor graduated	**22.2** ± 7.8	**41.9** ± 9.9	**10.5** ± 7.0	**25.3** ± 7.9	**100**
Smoking frequency					
Frequent smoker	**9.3** ± 5.9	**22.4** ± 9.4	**12.9** ± 9.3	**55.4** ± 12.1	**100**
Occasional smoker	**20.2** ± 11.0	**65.5** ± 14.0	**4.3** ± 3.3	**10.0** ± 8.1	**100**
30-day smoking status					
Has smoked in the past 30 days	**12.8** ± 5.3	**36.3** ± 9.5	**10.1** ± 6.5	**40.9** ± 9.9	**100**
Has not smoked in the past 30 days	**41.5** ± 6.2	**44.5** ± 6.2	**5.7** ± 2.3	**8.4** ± 2.8	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Social Situations that Accompany Smoking

Social situations that involve smoking create support for the behavior. These interactions may negatively affect a smoker's motivation to quit, self-efficacy for quitting and other factors related to quitting discussed in chapter 3. This section examines three social interactions that involve smoking: the belief that smoking provides a social benefit; the behavior of smoking mainly with other people or mainly when drinking alcohol; and exchanging cigarettes with other smokers.

Over 40 percent (43.5±5.3 percent) of young adult Minnesotans believe that smoking makes people feel more comfortable in social situations. This belief has been found to be commonly held in national surveys of adolescents in the United States.[13] There are no statistically significant differences among the subgroups.

Social smokers tend to smoke mainly as part of a social activity, often but not always accompanying the consumption of alcohol. Recent research has focused on social smoking among young adults because many young adults are increasingly identifying themselves as social smokers.[14] Social smokers are more likely to be occasional smokers, and many do not view themselves as addicted to nicotine or even as smokers and, for that reason, may be resistant to efforts to help them quit.[15]

Most social smokers say they want to quit or think they will give up smoking in the next few years, but research has not yet determined whether those social smokers are more likely to quit or become more regular smokers. Tracking and understanding social smoking among young adult Minnesotans is crucial to making sure that their needs can be appropriately addressed.

Among all young adult smokers, 42.4±9.8 percent smoke mainly when they are with other people (Table 5-16). However, there are significant differences between the different types of smokers. Among young adult frequent smokers, only 20.0±9.1 percent smoke mainly with other people, compared with 89.4±7.4 percent of occasional smokers. This suggests that smoking with other people may be a stage in the smoking initiation of young adults and that those who become frequent smokers develop smoking patterns that more closely resemble those of older adults. However, an extended longitudinal cohort study would be required to determine the extent to which young adult social smokers remain social smokers in later life.

Table 5-16. Influence of the presence of others on smoking among young adult 30-day smokers, by selected demographic characteristics and smoking frequency

Characteristics	Smoke mainly when with people	Smoke mainly when alone	Smoke as often alone as with others	Row total
	%	%	%	%
Overall	**42.4** ± 9.8	**4.9** ± 3.7	**52.8** ± 9.9	**100**
Gender				
Female	**40.8** ± 14.3	**8.3** ± 8.7	**50.9** ± 15.1	**100**
Male	**43.3** ± 13.3	**2.7** ± 2.0	**54.0** ± 13.2	**100**
College status				
Enrolled or graduated	**47.5** ± 15.3	**7.9** ± 7.4	**44.6** ± 15.4	**100**
Neither enrolled nor graduated	**32.1** ± 13.1	**1.8** ± 1.8	**66.1** ± 13.2	**100**
Smoking frequency				
Frequent smoker	**20.0** ± 9.1	**4.8** ± 4.9	**75.2** ± 10.0	**100**
Occasional smoker	**89.4** ± 7.4	**5.0** ± 5.0	**5.5** ± 5.5	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Over half (56.1±11.8 percent) of young adult smokers who have had at least one alcoholic drink in the past 30 days are more likely to smoke while drinking (Table 5-17). As with smoking with other people, occasional smokers (79.2±13.4 percent) are more likely to smoke while drinking compared with frequent smokers (48.0±14.6 percent). While not statistically significant, this difference is large enough to be of interest. There are no statistically significant differences for any other subgroups.

Table 5-17. Influence of drinking on smoking among young adult 30-day smokers who had at least one drink in the past 30 days, by selected demographic characteristics and smoking frequency

Characteristics	More likely to smoke while drinking	More likely to smoke while not drinking	Just as likely to smoke while drinking as when not	Row total
	%	%	%	%
Overall	**56.1** ± 11.8	**3.9** ± 3.5	**40.0** ± 11.9	**100**
Gender				
Female	**65.0** ± 16.8	**3.8** ± 4.8	**31.2** ± 16.4	**100**
Male	**50.0** ± 15.7	**3.9** ± 4.9	**46.1** ± 15.9	**100**
College status				
Enrolled or graduated	**49.5** ± 16.7	**6.1** ± 6.8	**44.3** ± 17.3	**100**
Neither enrolled nor graduated	**64.0** ± 17.0	**1.6** ± 1.3	**34.4** ± 16.9	**100**
Smoking frequency				
Frequent smoker	**48.0** ± 14.6	**1.2** ± 1.0	**50.8** ± 14.6	**100**
Occasional smoker	**79.2** ± 13.4	**11.4** ± 12.3	**9.4** ± 6.5	**100**

Source: Minnesota Adult Tobacco Survey, 2007

More than one-quarter (28.0±9.2 percent) of young adult smokers obtain most of their cigarettes from another smoker (Table 5-18). Occasional smokers (72.4±13.3 percent) are 10 times more likely to get most of their cigarettes from other smokers than frequent smokers (7.1±6.4 percent). Young adult smokers also commonly give cigarettes to others—80.4±6.6 percent have given cigarettes to others in the past 30 days. Frequent smokers (97.5±2.4 percent) are about twice as likely to give cigarettes to others compared with occasional smokers (44.1±18.0 percent).

Table 5-18. Obtaining and giving away cigarettes among young adult 30-day smokers, by selected demographic characteristics and smoking frequency

Characteristics	Obtaining cigarettes			Gave away cigarettes to others (past 30 days)
	Buy most myself	Get most from another smoker	Row total	
	%	%	%	%
Overall	**72.0** ± 9.2	**28.0** ± 9.2	**100**	**80.4** ± 6.6
Gender				
Female	**77.2** ± 11.8	**22.8** ± 11.8	**100**	**84.2** ± 8.1
Male	**68.7** ± 13.0	**31.4** ± 13.0	**100**	**77.9** ± 9.5
College status				
Enrolled or graduated	**62.7** ± 15.3	**37.3** ± 15.3	**100**	**72.6** ± 11.9
Neither enrolled nor graduated	**82.9** ± 10.6	**17.1** ± 10.6	**100**	**90.8** ± 5.5
Smoking frequency				
Frequent smoker	**92.9** ± 6.4	**7.1** ± 6.4	**100**	**97.5** ± 2.4
Occasional smoker	**27.7** ± 13.3	**72.4** ± 13.3	**100**	**44.1** ± 18.0

Source: Minnesota Adult Tobacco Survey, 2007

5.4.4 Characteristics of Young Adult Smokers, 2003 to 2007

While many characteristics of smokers tend to remain stable, a few noteworthy changes have occurred between 2003 and 2007. This section describes changes that were statistically significant or nearly significant.

Between 2003 and 2007, the percentage of current young adult smokers who initiated smoking after age 18 doubled, from 9.2±3.8 percent in 2003 to 19.0±7.7 percent in 2007 (Table 5-19). This increase of 9.8±8.6 percentage points is statistically significant. Young adults appear to be waiting longer to start smoking. It is no longer relatively safe to assume that a young person will never try smoking if he or she has not already done so before turning 18.

Between 2003 and 2007, fewer young adults, especially nonsmokers, reported that they were living with someone who smokes. In 2003, 38.9±4.6 percent of young adults lived with a smoker. By 2007, this declined significantly by 10.4±6.6 percentage points to 28.6±4.8 percent. In contrast, the percentage of young adult smokers who live with a smoker remained constant, at close to 60 percent (Figure 5-3).

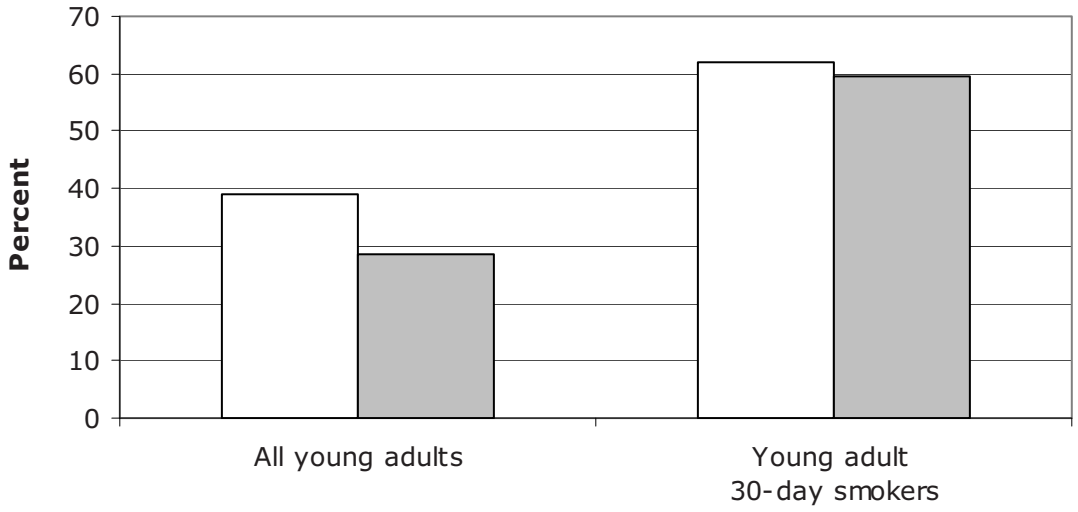
Table 5-19. Age of smoking initiation among young adult 30-day smokers, from 2003 to 2007

Age of initiation	2003	2007	Change over time 2003 to 2007
	%	%	%
11 years old and younger	**17.0** ± 5.5	**11.2** ± 7.4	**-5.8** ± 9.3
12-14-years-old	**37.7** ± 7.0	**40.4** ± 10.0	**2.7** ± 12.2
15-17-years-old	**36.2** ± 6.9	**29.4** ± 8.6	**-6.8** ± 11.0
18 years and older	**9.2** ± 3.8	**19.0** ± 7.7	**9.8** ± 8.6*

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

Figure 5-3. Living with a smoker among all young adults and young adult 30-day smokers, from 2003 to 2007



Young adults living with a smoker

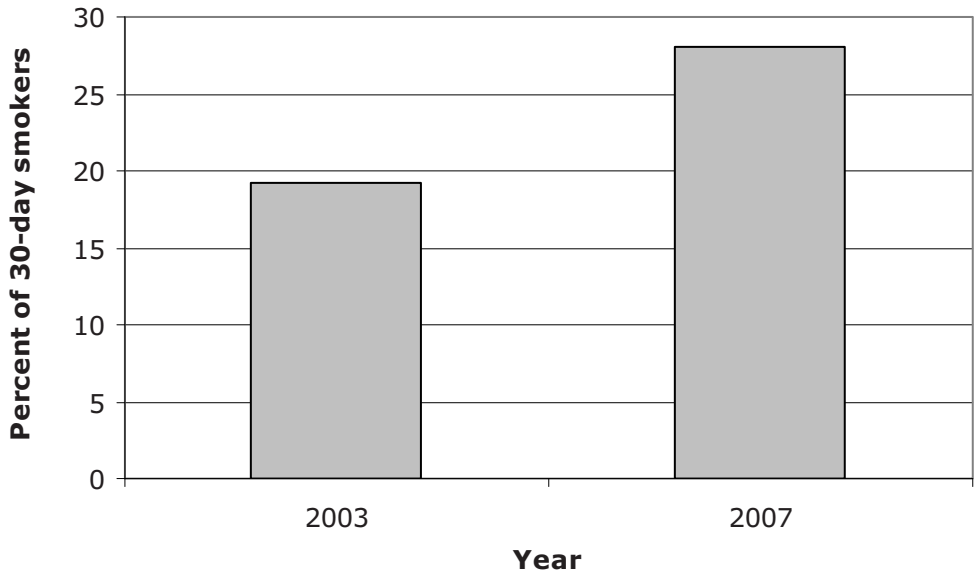
Year	All young adults	Young adult 30-day smokers
2003	38.9 ± 4.6	62.1 ± 6.7
2007	28.6 ± 4.8	59.5 ± 9.3
Change over time 2003 to 2007	-10.4 ± 6.6 %*	-2.7 ± 11.5 %

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

There was an increase in the percentage of smokers who usually obtain cigarettes from others, although this was not statistically significant. In 2003, 19.3±5.7 percent of young adult smokers obtained most of their cigarettes from others, compared with 28.0±9.2 percent in 2007 (Figure 5-4).

Figure 5-4. Getting most cigarettes from another smoker among young adult 30-day smokers, from 2003 to 2007



			Change over time
	2003	2007	2003 to 2007
Get cigarettes from another smoker	19.3 ± 5.7	28.0 ± 9.2	8.8 ± 10.8 %

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

5.5 Quitting Smoking among Young Adults

As discussed in chapter 3, quitting smoking reduces the risk of premature death and disease, and while all smokers benefit from quitting, the earlier they quit, the more likely they are to realize substantial health benefits. This section examines quitting smoking among young adult smokers, many of whom (as mentioned above) do not consider themselves smokers, and uses concepts and definitions described in section 3.2.

5.5.1 Quitting among Current Smokers

In the past 12 months, 55.1±9.9 percent of current young adult smokers in Minnesota stopped smoking for one day or longer because they were trying to quit smoking (Table 5-20). There are no significant differences by gender or college status. Over 60 percent (62.3±11.6 percent) of frequent smokers made a quit attempt, but only 39.7±16.1 percent of occasional smokers did so. This large difference approaches statistical significance. The observation in section 5.4.1—that relatively few occasional smokers (14.3 percent) regard themselves as smokers but nearly all frequent smokers do—may explain this finding. Someone who does not regard himself or herself as a smoker may be less inclined to stop smoking.

Table 5-20. Current young adult 30-day smokers with a quit attempt in the past 12 months, by selected demographic characteristics and smoking frequency

Characteristics	Made a quit attempt
	%
Overall	**55.1** ± 9.9
Gender	
Female	**54.1** ± 14.9
Male	**55.7** ± 13.3
College status	
Enrolled or graduated	**54.9** ± 15.4
Neither enrolled nor graduated	**54.3** ± 14.9
Smoking frequency	
Frequent smoker	**62.3** ± 11.6
Occasional smoker	**39.7** ± 16.1

Source: Minnesota Adult Tobacco Survey, 2007

5.5.2 Awareness and Use of Quitting Programs and Medications

Young adults who make a quit attempt are less likely than older adults to use evidence-based cessation treatment, whether stop-smoking medications, behavioral counseling or a combination.[16] As noted in section 3.2.2, they are more likely to believe that they can quit without stop-smoking aids. This section reports on their awareness, knowledge and use of evidence-based methods of quitting smoking.

Awareness of, Use of and Attitude toward Assistance

Among all young adult smokers, 68.9±5.0 percent are aware of free programs to help smokers quit. There are no differences in awareness by gender, college status or smoking frequency.

The following discussion of young adult smokers' use of and attitude toward various forms of quit-smoking assistance is limited to current established smokers (have smoked 100 or more cigarettes in their lifetime and now smoke every day or some days), rather than all young adult smokers (30-day smokers). This exception to the usual definition of young adult smokers in this chapter is because the MATS 2007 interview asked only established current smokers about specific types of quit aids.

Use of Assistance. Nearly one-third (28.7±13.7 percent) of young adult established smokers used some form of assistance in an attempt to quit smoking, including medications and behavioral counseling (Table 5-21). Nearly the same proportion of young adult established smokers (28.3±13.7 percent) used some form of stop-smoking medication, including over-the-counter and prescription nicotine replacement therapy (NRT) and other prescription medication. Similarly, 25.7±13.5 percent of young adult established smokers used NRT, which may include prescription NRT. Few young adult smokers (only 5.5±6.1 percent) used a prescription medication the last time they tried to quit smoking in the past 12 months. A very small percentage (1.1±0.9 percent) of young adult smokers used any form of behavioral assistance in their attempt to quit smoking.

Attitude toward Quit Assistance. If young adults were trying to quit smoking and cost were not an issue, 60.4±11.5 percent would be willing to use some form of quit assistance. There are no significant differences by gender or college enrollment.

5.5.3 Quit Attempts among Young Adult Smokers, 2003 to 2007

Many young adults have not been smokers long enough to have quit and, as noted, many young adult smokers do not consider themselves smokers, a phenomenon that probably limits their motivation to quit. Therefore, the trend analysis is limited to the number of young adult smokers who have tried to quit in the past year. The trend in quit attempts among young adults remained essentially flat between 2003

and 2007. In 2003, slightly more than 60 percent (62.8±6.8 percent) of young adult smokers had tried to quit in the past year, which did not statistically differ in 2007 (55.1±9.9 percent).

Table 5-21. Use of various forms of assistance to aid quitting among young adults who are current established 30-day smokers, by selected demographic characteristics and smoking frequency

Characteristics	Any assistance	Medication assistance			Behavioral assistance
	Medication and/or behavioral	Any	Prescription	NRT	Any
	%	%	%	%	%
Overall	**28.7** ± 13.7	**28.3** ± 13.7	**5.5** ± 6.1	**25.7** ± 13.5	**1.1** ± 0.9
Gender					
Female	**30.8** ± 24.6	**30.5** ± 24.6	**8.0** ± 12.1	**29.1** ± 24.7	**1.6** ± 1.7
Male	**27.2** ± 16.2	**26.9** ± 16.1	**3.8** ± 6.4	**23.4** ± 15.2	**0.8** ± 1.0
College status					
Enrolled or graduated	**24.0** ± 17.3	**23.7** ± 17.2	**0.7** ± 1.0	**23.0** ± 17.1	**0.5** ± 0.8
Neither enrolled nor graduated	**31.3** ± 24.1	**30.8** ± 24.1	**1.9** ± 1.8	**29.8** ± 24.1	**2.1** ± 2.0

Source: Minnesota Adult Tobacco Survey, 2007

5.6 Assistance from Doctors among Young Adults

This section looks at the quitting assistance that young adult smokers receive from their doctors. Chapter 3 investigated Minnesota smokers' experiences with doctors, nurses, pharmacists and dentists, separately and across the range of health care providers. Experiences with doctors as a provider type account for the large majority of experiences with all provider types. The number of young adult smokers in the sample is small, and any analysis for provider types other than doctor would be based on even smaller samples. For this reason, this discussion of young adult smokers' interactions with health care providers focuses exclusively on doctors. This section uses concepts and definitions described in section 3.3.

Among all young adults, 61.7±5.3 percent saw a doctor in the last 12 months. The figure is comparable for young adult smokers, 63.3±9.5 percent of whom saw a doctor.

Among young adult smokers who saw a doctor in the last 12 months, 81.2±12.1 percent of them were asked by the doctor if they smoked and 64.6±15.3 percent

were advised to quit (Table 5-22). Those who received some form of referral in quitting represented 22.4±10.8 percent of those who visited a doctor. While there are some apparently large differences between percentages of members of the different gender, college status and smoking frequency subgroups that received each step, the small sample sizes make detecting statistical significance difficult. The percentage of frequent smokers (26.7±12.8 percent) that received some form of referral compared with occasional smokers (4.3±4.6 percent) is one exception.

Table 5-22. Ask, Advise and Refer model services received from doctors among young adult 30-day smokers who visited a doctor in last 12 months, by selected demographics and smoking frequency

Characteristics	Ask	Advise	Refer
	%	%	%
Overall	**81.2** ± 12.1	**64.6** ± 15.3	**22.4** ± 10.8
Gender			
Female	**93.0** ± 9.5	**66.4** ± 18.9	**30.1** ± 16.4
Male	**67.8** ± 21.2	**62.4** ± 25.2	**13.2** ± 11.9
College status			
Enrolled or graduated	**72.5** ± 19.2	**57.5** ± 25.2	**14.8** ± 14.3
Neither enrolled nor graduated	**89.8** ± 13.5	**72.2** ± 20.3	**27.6** ± 16.6
Smoking frequency			
Frequent smoker	**84.0** ± 15.4	**65.8** ± 16.9	**26.7** ± 12.8
Occasional smoker	**76.2** ± 19.8	**59.7** ± 37.8	**4.3** ± 4.6

Source: Minnesota Adult Tobacco Survey, 2007

Large but not significant differences can be noted for being asked (women, frequent smokers and non-college young adults being asked at higher rates than their respective complement groups), being advised not to smoke (non-college being advised more commonly than college), and receiving some form of referral (women and non-college at higher rates, in addition to the statistically significant higher rate for frequent smokers noted above). While the small sample sizes hamper the applicability of these observations, the consistency of the patterns suggests that future exploration along these lines might find real associations between these selected characteristics of young smokers and receipt of the intervention steps from doctors. More in-depth explanatory data would be needed to go beyond mere statistical associations, however, since there are no obvious inherent explanations for why certain groups tended to receive such forms of assistance from doctors.

5.7 Raising the Cost of Tobacco Products and Quitting among Young Adults

This section focuses on young adults' reactions to the 2005 health impact fee, which resulted in a 75-cent increase in the cost of tobacco products in Minnesota. The increase went into effect on Aug. 1, 2005. This section uses concepts and definitions described in section 3.5.

Young adult smokers were similar to Minnesota smokers in general in their reaction to the fee (Table 5-23, compared with Table 3-17). Overall, 40.6±10.2 percent of young adult smokers thought about quitting as a result of the cost increase, 30.4±9.7 percent cut down on cigarettes and 33.8±10.1 percent made an attempt to quit as a result of the cost increase. There were no significant differences in thinking about quitting, cutting down, or attempting to quit between frequent and occasional smokers, although there are some noticeable apparent differences in cutting down.

Table 5-23. Smoking-related reactions to the 2005 tobacco cost increase among young adult 30-day smokers, by smoking frequency

Smoking frequency	Reactions			
	Thought about quitting	Cut down on cigarettes	Made a quit attempt	Maintained a quit attempt
	%	%	%	%
Overall	**40.6** ± 10.2	**30.4** ± 9.7	**33.8** ± 10.1	**17.0** ± 9.2
Frequent smoker	**40.7** ± 12.4	**24.2** ± 11.0	**30.6** ± 12.0	**9.8** ± 9.8
Occasional smoker	**40.2** ± 18.1	**43.7** ± 17.8	**40.7** ± 17.9	**32.1** ± 18.2

Source: Minnesota Adult Tobacco Survey, 2007

In addition, 17.0±9.2 percent of young adult smokers report that the cost increase helped them maintain a quit attempt. This means that as a result of the cost increase they tried to quit smoking, succeeded for some time in maintaining their quit, then relapsed to smoking. (The length of time these smokers were quit is not known.) There was a large but not significant difference between frequent smokers and occasional smokers, with 9.8±9.8 percent of frequent smokers maintaining a quit

attempt and 32.1±18.2 percent of occasional smokers maintaining a quit attempt as a result of the cost increase.

5.8 Perceptions among Young Adults that Secondhand Smoke Is Harmful

As presented in section 4.1, secondhand smoke has been shown to be harmful in the scientific literature. However, the perceptions of secondhand smoke's harmfulness among young adults may vary and have an effect on their interest in and support for clean indoor air policies. This section uses concepts and definitions as explained in section 4.2.

There is very high agreement among young adults that secondhand smoke exposure is harmful. Among all young adults, 94.2±2.3 percent believe it is very or somewhat harmful (Table 5-24). However, smokers (85.1±7.1 percent) are significantly less likely than nonsmokers (97.8±1.2 percent) to agree that secondhand smoke is very or somewhat harmful.

Table 5-24. Perceived harmfulness of secondhand smoke by young adults, by selected demographic characteristics and 30-day smoking status

Characteristics	Very or somewhat harmful to one's health %
Overall	**94.2** ± 2.3
Gender	
Female	**97.0** ± 2.7
Male	**91.6** ± 3.6
College status	
Enrolled or graduated	**96.7** ± 1.9
Neither enrolled nor graduated	**89.5** ± 6.2
30-day smoking status	
Has smoked in the past 30 days	**85.1** ± 7.1
Has not smoked in the past 30 days	**97.8** ± 1.2

Source: Minnesota Adult Tobacco Survey, 2007

5.9 Support for Local Smoke-free Policies among Young Adults

The MATS 2007 survey was conducted before the statewide smoke-free air law, the Freedom to Breathe Act, was passed or implemented. Nonetheless, MATS 2007 showed a high level of support among young adults for comprehensive smoke-free laws covering the workplace and other public spaces. This section uses concepts and definitions described in section 4.3.

5.9.1 Support for Smoke-free Workplaces

Among young adults, 44.2±5.2 percent say that a smoke-free workplace environment (including restaurants and bars) is very important, and an additional 32.3±5.2 percent say that it is somewhat important (Table 5-25). Young adult smokers have a very different perspective; only 19.7±7.3 percent of them assert that a policy prohibiting smoking in the workplace is very important, compared with 53.8±6.3 percent of nonsmokers.

Table 5-25. Importance of having a smoke-free environment inside workplaces among young adults, by selected demographic characteristics, smoking frequency and 30-day smoking status

Characteristics	Very important	Somewhat important	Not too important	Not at all important	Row total
	%	%	%	%	%
Overall	**44.2** ± 5.2	**32.3** ± 5.2	**11.8** ± 3.5	**11.8** ± 3.1	**100**
Gender					
Female	**56.4** ± 7.2	**28.6** ± 6.7	**8.6** ± 3.5	**6.4** ± 3.2	**100**
Male	**32.8** ± 6.6	**35.8** ± 7.8	**14.7** ± 5.8	**16.7** ± 5.1	**100**
College status					
Enrolled or graduated	**47.1** ± 6.8	**33.8** ± 6.8	**11.7** ± 5.1	**7.4** ± 3.3	**100**
Neither enrolled nor graduated	**36.8** ± 10.2	**28.6** ± 8.7	**13.7** ± 5.8	**20.9** ± 7.3	**100**
Smoking frequency					
Frequent smoker	**10.9** ± 7.0	**35.8** ± 12.3	**20.3** ± 10.4	**33.0** ± 11.3	**100**
Occasional smoker	**38.2** ± 16.3	**25.0** ± 13.3	**24.6** ± 18.6	**12.2** ± 8.2	**100**
30-day smoking status					
Has smoked in the past 30 days	**19.7** ± 7.3	**32.3** ± 9.5	**21.7** ± 9.3	**26.3** ± 8.3	**100**
Has not smoked in the past 30 days	**53.8** ± 6.3	**32.3** ± 6.2	**7.9** ± 2.8	**6.0** ± 2.6	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Most young adults (73.8±5.2 percent) also would prefer that smoking was not allowed in their own work area (Table 5-26). There are statistically significant differences in this preference by gender, college status and smoking status. Young adult women (85.1±5.4 percent) are more likely than men (63.1±8.4 percent) to prefer a smoke-free work area. The college group (80.0±6.4 percent) is more likely to prefer that smoking not be allowed than the non-college group (60.2±10.7 percent). Young adult smokers have a very different pattern; only 43.2±11.2 percent of them prefer a smoke-free work area compared with 85.8±4.1 percent of nonsmokers.

An indirect indicator of acceptance of smoke-free restaurants and bars is the impact smoke-free policies would have on economic behavior. When asked how a policy against smoking in restaurants and bars would affect how often they went out, 75.3±4.2 percent of young adults say it would make no difference, and 17.5±3.5 percent say that they would go out more often (Table 5-27). This more than offsets the smaller 7.2±2.6 percent who say they would go out less often. There is a statistically significant difference by smoking frequency. Ninety percent (90.9±8.6 percent) of occasional smokers say that smoke-free restaurants and bars would have no effect on how often they went out, compared with 68.0±11.3 percent of frequent smokers. There are no significant differences by gender, smoking status or college enrollment.

Table 5-26. Preference to work where smoking is allowed/is not allowed when working indoors among young adults, by selected demographic characteristics, smoking frequency and 30-day smoking status

Characteristics	Preference				
	Smoking allowed	Smoking not allowed	Makes no difference	Never works indoors	Row total
	%	%	%	%	%
Overall	**2.4** ± 2.0	**73.8** ± 5.2	**23.7** ± 4.9	**0.1** ± 0.1	**100**
Gender					
Female	**2.7** ± 3.3	**85.1** ± 5.4	**12.1** ± 4.4	**0.1** ± 0.1	**100**
Male	**2.2** ± 2.4	**63.1** ± 8.4	**34.6** ± 8.2	**0.1** ± 0.2	**100**
College status					
Enrolled or graduated	**2.4** ± 2.8	**80.0** ± 6.4	**17.5** ± 6.0	**0.1** ± 0.1	**100**
Neither enrolled nor graduated	**1.6** ± 1.8	**60.2** ± 10.7	**38.1** ± 10.5	**0.2** ± 0.3	**100**
Smoking frequency					
Frequent smoker	**11.8** ± 9.9	**35.9** ± 13.8	**52.1** ± 14.1	**0.2** ± 0.3	**100**
Occasional smoker	**0.8** ± 1.2	**59.0** ± 21.4	**39.7** ± 21.6	**0.5** ± 1.1	**100**
30-day smoking status					
Has smoked in the past 30 days	**8.4** ± 6.9	**43.2** ± 11.2	**48.2** ± 11.5	**0.3** ± 0.4	**100**
Has not smoked in the past 30 days	**0.0** ± 0.1	**85.8** ± 4.1	**14.1** ± 4.1	**0.0** ± 0.0	**100**

Source: Minnesota Adult Tobacco Survey, 2007

Table 5-27. Effect of actual and proposed smoking restrictions in restaurants and bars on young adults going out, by selected demographic characteristics, smoking frequency and 30-day smoking status

Characteristics	Do/would go out more	Do/would go out less	Does not/would not make a difference	Row total
	%	%	%	%
Overall	**17.5** ± 3.5	**7.2** ± 2.6	**75.3** ± 4.2	**100**
Gender				
Female	**23.2** ± 5.1	**6.7** ± 3.6	**70.1** ± 5.9	**100**
Male	**12.1** ± 5.0	**7.7** ± 3.8	**80.2** ± 6.0	**100**
College status				
Enrolled or graduated	**24.0** ± 5.5	**4.2** ± 2.2	**71.8** ± 5.7	**100**
Neither enrolled nor graduated	**7.0** ± 3.4	**13.4** ± 7.0	**79.5** ± 7.5	**100**
Smoking frequency				
Frequent smoker	**1.3** ± 2.0	**30.8** ± 11.2	**68.0** ± 11.3	**100**
Occasional smoker	**4.3** ± 6.1	**4.7** ± 6.2	**90.9** ± 8.6	**100**
30-day smoking status				
Has smoked in the past 30 days	**2.3** ± 2.4	**22.4** ± 8.2	**75.4** ± 8.4	**100**
Has not smoked in the past 30 days	**23.5** ± 4.7	**1.2** ± 1.1	**75.3** ± 4.8	**100**

Source: Minnesota Adult Tobacco Survey, 2007

5.9.2 Support for Local Smoke-free Policies among Young Adults, 2003 to 2007

Support for a smoke-free policy in their own work area remained high but essentially unchanged between 2003 and 2007. In 2003, 67.5±4.7 percent of young adults said they prefer to work where smoking is not allowed compared with 73.8±5.2 percent in 2007.

There was no statistically significant change between 2003 (76.8±4.0 percent) and 2007 (75.3±4.2 percent) in the percentage of young adults who said that smoke-free ordinance that restricted smoking in bars and restaurants would make no difference in how often they go out.

5.10 Young Adults Covered by Smoke-free Policies

The history of Minnesota's smoke-free policies is described in chapter 4, and the prevalence in the general population of secondhand smoke policies at work, at home and in the community is described in detail in section 4.4. The following section provides an overview of the prevalence of secondhand smoke policies in the workplaces and homes of young adults. This section uses concepts and definitions explained in section 4.4.

5.10.1 Prevalence of Smoke-free Policies Covering Young Adults

Smoke-free Policies at Work

Analysis of workplace smoking policies is limited to those young adults who are employed outside their homes. Smoking is prohibited in the work areas and indoor common areas of 64.3±6.1 percent of young adult Minnesotans who work (Table 5-28). Over 75 percent (77.6±7.4 percent) of young adult women are covered by a smoke-free policy in their work areas and indoor common areas, compared with 52.0±9.1 percent of young adult men, a statistically significant difference. The difference between the college and non-college groups is also statistically significant, with 71.5±7.1 percent of the college group covered by smoke-free policies at work compared to only 52.5±11.5 percent of the non-college group.

Table 5-28. Young adults covered by smoke-free policies in work areas and indoor common areas at work, by selected demographic characteristics and 30-day smoking status

Characteristics	Smoking not allowed anywhere in these areas
	%
Overall	**64.3** ± 6.1
Gender	
Female	**77.6** ± 7.4
Male	**52.0** ± 9.1
College status	
Enrolled or graduated	**71.5** ± 7.1
Neither enrolled nor graduated	**52.5** ± 11.5
30-day smoking status	
Has smoked in the past 30 days	**63.5** ± 11.1
Has not smoked in the past 30 days	**64.7** ± 7.4

Source: Minnesota Adult Tobacco Survey, 2007

Smoke-free Rules at Home

Among all young adult Minnesotans, 87.5±3.1 percent live where there is a rule prohibiting smoking inside the home (Table 5-29). There are statistically significant differences in living under such a rule by smoking status and college status. Young adult smokers (75.4±8.2 percent) are less likely to live where there is a rule prohibiting smoking inside the home than are nonsmokers (92.3±2.7 percent). Similarly, members of the non-college group (75.6±8.5 percent) are less likely to live where there is such a rule than are members of the college group (93.0±2.4 percent).

Table 5-29. Young adults living in homes with smoke-free rules, by selected demographic characteristics, smoking frequency and 30-day smoking status

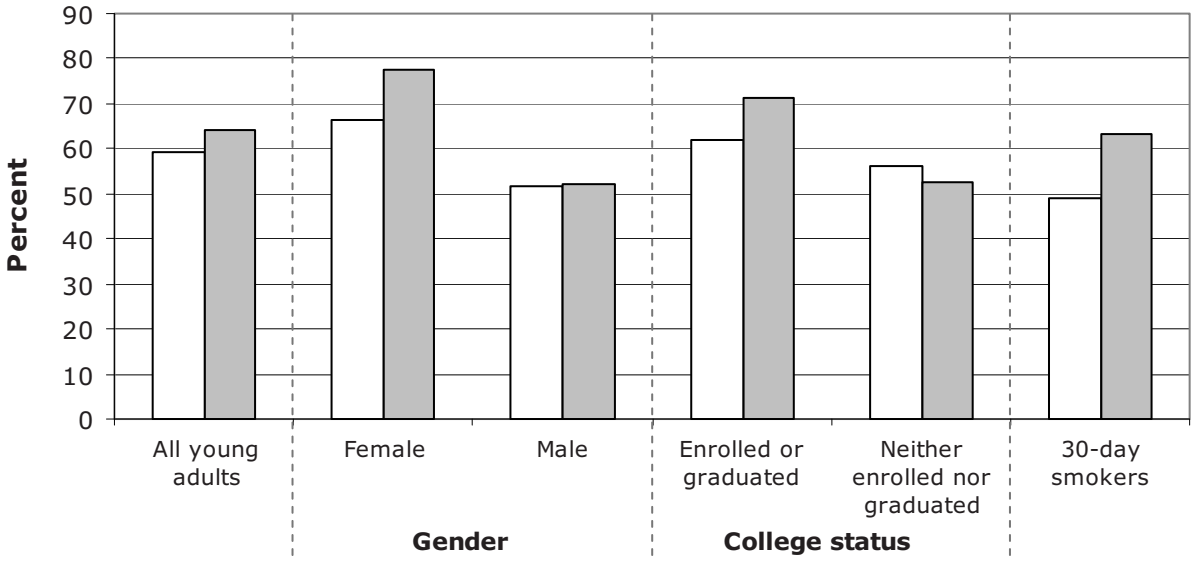
Characteristics	Smoking not allowed anywhere inside home
	%
Overall	**87.5** ± 3.1
Gender	
Female	**85.3** ± 4.8
Male	**89.6** ± 4.0
College status	
Enrolled or graduated	**93.0** ± 2.4
Neither enrolled nor graduated	**75.6** ± 8.5
Smoking frequency	
Frequent smoker	**69.9** ± 10.7
Occasional smoker	**87.2** ± 11.4
30-day smoking status	
Has smoked in the past 30 days	**75.4** ± 8.2
Has not smoked in the past 30 days	**92.3** ± 2.7

Source: Minnesota Adult Tobacco Survey, 2007

5.10.2 Young Adults Covered by Smoke-free Policies, 2003 to 2007

The percentage of young adults covered by smoke-free policies in their work area and indoor common areas remained essentially unchanged between 2003 (59.2±5.0 percent) and 2007 (64.3±6.1 percent) (Figure 5-5). However, there was a significant increase in the percentage of young adult women covered by a smoke-free policy at work, increasing 11.1±9.6 percentage points between 2003 (66.5±6.1 percent) and 2007 (77.6±7.4 percent). There were no significant changes among the college or non-college group. In 2003, 48.9±8.2 percent of young adult smokers were covered by a smoke-free policy at work, compared with 63.5±11.1 percent in 2007. This increase of 14.6±13.7 percentage points is statistically significant.

Figure 5-5. Young adults covered by smoke-free policies at work†, by selected demographic characteristics and for 30-day smokers, from 2003 to 2007



Year	All young adults	Demographic characteristics				30-day smokers
		Gender		College status		
		Female	Male	Enrolled or graduated	Neither enrolled nor graduated	
□ 2003	59.2 ± 5.0	66.5 ± 6.1	51.6 ± 7.8	62.1 ± 6.6	56.3 ± 8.4	48.9 ± 8.2
▒ 2007	64.3 ± 6.1	77.6 ± 7.4	52.0 ± 9.1	71.5 ± 7.1	52.5 ± 11.5	63.5 ± 11.1
Change over time 2003 to 2007	5.1 ± 7.9 %	11.1 ± 9.6 %*	0.4 ± 12.0 %	9.4 ± 9.7 %	-3.7 ± 14.2 %	14.6 ± 13.7 %*

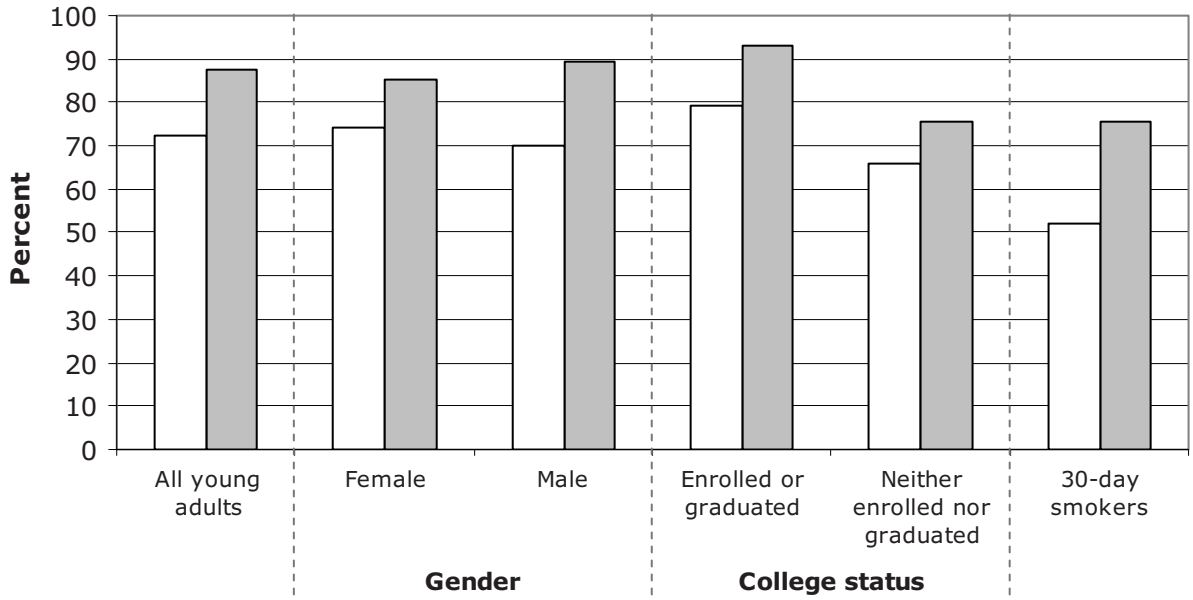
†Work areas and indoor common areas

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

The percentage of young adults covered by smoke-free policies in their homes increased significantly between 2003 and 2007 (Figure 5-6). In 2003, 72.2±4.0 percent of young adults had a smoke-free policy in their home. This increased by 15.4±5.1 percentage points to 87.5±3.1 percent in 2007. There were also statistically significant increases among women (11.0±7.0 percentage points), men (19.5±7.3 percentage points), the college group (13.8±7.4 percentage points) and young adult smokers (23.6±10.9 percentage points).

Figure 5-6. Young adults living in homes with smoke-free rules, by selected demographic characteristics and for 30-day smokers, from 2003 to 2007



Year	All young adults	Demographic characteristics				30-day smokers
		Gender		College status		
		Female	Male	Enrolled or graduated	Neither enrolled nor graduated	
2003	72.2 ± 4.0	74.3 ± 5.1	70.1 ± 6.1	79.2 ± 4.8	66.1 ± 7.2	51.9 ± 7.2
2007	87.5 ± 3.1	85.3 ± 4.8	89.6 ± 4.0	93.0 ± 2.4	75.6 ± 8.5	75.4 ± 8.2
Change over time 2003 to 2007	15.4 ± 5.1 %*	11.0 ± 7.0 %*	19.5 ± 7.3 %*	13.8 ± 5.4 %*	9.5 ± 11.1 %	23.6 ± 10.9 %*

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Survey, 2003 and 2007

5.11 Secondhand Smoke Exposure among Young Adults

This section focuses on the exposure of young adults to secondhand smoke in any setting and then examines exposure at work, in a car, and at home, using concepts and definitions explained in section 4.5.

Among all young adult Minnesotans, 73.2±5.1 percent were exposed to secondhand smoke in any location over the past seven days, much higher than the overall percent of Minnesotans exposed (56.7±1.6 percent) (Table 5-30 compared with Figure 4-6). There are statistically significant differences in exposure to secondhand

smoke by smoking status and college enrollment. Over 90 percent of young adult smokers (93.2±5.1 percent) have been exposed to secondhand smoke, compared with 65.2±6.4 percent of nonsmokers. Also, young adults who are not in the college group (85.2±5.7 percent) are more likely to be exposed to secondhand smoke than those who are in the college group (68.2±7.0 percent).

Table 5-30. Young adults exposed to secondhand smoke in the past seven days in various settings, by selected demographic characteristics, smoking frequency and 30-day smoking status

Characteristics	Setting				
	At any location	At home	In own work area	In a car	In the community at large
	%	%	%	%	%
Overall	73.2 ± 5.1	12.8 ± 3.5	22.9 ± 4.9	41.4 ± 5.1	58.3 ± 5.3
Gender					
Female	72.5 ± 6.8	13.6 ± 4.8	15.3 ± 5.7	38.2 ± 6.9	56.0 ± 7.2
Male	73.9 ± 7.6	12.0 ± 5.2	30.0 ± 7.7	44.3 ± 7.5	60.4 ± 7.8
College status					
Enrolled or graduated	68.2 ± 7.0	7.8 ± 3.9	18.3 ± 5.7	34.6 ± 6.5	54.8 ± 7.0
Neither enrolled nor graduated	85.2 ± 5.7	24.7 ± 8.5	30.5 ± 10.2	58.4 ± 9.9	67.2 ± 8.6
Smoking frequency					
Frequent smoker	95.5 ± 5.0	28.3 ± 10.6	34.4 ± 13.7	94.8 ± 5.1	84.7 ± 8.1
Occassional smoker	88.5 ± 11.8	27.8 ± 19.5	22.2 ± 13.9	74.6 ± 13.4	75.8 ± 13.6
30-day smoking status					
Has smoked in the past 30 days	93.2 ± 5.1	28.1 ± 9.5	30.6 ± 10.5	88.3 ± 5.6	81.8 ± 7.0
Has not smoked in the past 30 days	65.2 ± 6.4	6.7 ± 2.6	19.9 ± 5.3	22.8 ± 4.7	48.9 ± 6.2

Note: Smoking reported at home or in work areas could refer to smoker's own smoking, as well as that of others. If report referred only to smoker, this does not represent the person's exposure to secondhand smoke. True secondhand smoke exposure may be somewhat lower than presented for home and work areas.

Source: Minnesota Adult Tobacco Survey, 2007

Exposure to secondhand smoke varies by setting. Young adult Minnesotans are significantly more likely to be exposed to secondhand smoke in the community at large* (58.3±5.3 percent) than at work (22.9±4.9 percent), in a car (41.4±5.1 percent), or at home (12.8±3.5 percent). Further, the level of young adult exposure differs across each of these settings in statistically significant ways.

The following sections examine secondhand smoke exposure in the community, work, car and home settings in more detail.

* Community exposure means the person is exposed to secondhand smoke somewhere other than work, car or home.

5.11.1 Secondhand Smoke Exposure in the Community

Nearly 60 percent (58.3±5.3 percent) of young adult Minnesotans are exposed to secondhand smoke somewhere in their community other than in their work area, car or home (Table 5-30). There are significant differences in community exposure by smoking status. Over 80 percent (81.8±7.0 percent) of young adult smokers were exposed to secondhand smoke in their community, compared with 48.9±6.2 percent of nonsmokers.

5.11.2 Secondhand Smoke Exposure at Work

Among all young adult Minnesotans who are employed outside their homes, 22.9±4.9 percent were exposed to secondhand smoke in their own work area in the past seven days (Table 5-30). There are significant differences in exposure to secondhand smoke at work by gender. Fifteen percent (15.3±5.7 percent) of young adult women were exposed to secondhand smoke at work, compared with 30.0±7.7 percent of young adult men, likely due to the different types of jobs young adult men and women have. Young adult smokers (30.6±10.5 percent) are more likely to be exposed to secondhand smoke at work than nonsmokers (19.9±5.3 percent), although the difference is not statistically significant.

5.11.3 Secondhand Smoke Exposure in a Car

About 40 percent (41.4±5.1 percent) of young adults were exposed to secondhand smoke in a car in the past seven days (Table 5-30). There are significant differences in exposure to secondhand smoke in a car by smoking status, smoking frequency and college status. Almost 90 percent (88.3±5.6 percent) of young adult smokers were exposed to secondhand smoke in a car, compared with 22.8±4.7 percent of nonsmokers. Frequent smokers (94.8±5.1 percent) are more likely to be exposed in a car than occasional smokers (74.6±13.4 percent). Young adults in the college group (34.6±6.5 percent) are less likely to be exposed than the non-college young adults (58.4±9.9 percent).

5.11.4 Secondhand Smoke Exposure at Home

Among all young adult Minnesotans, 12.8±3.5 percent say that someone has smoked cigarettes inside their home in the past seven days (Table 5-30). There are statistically significant differences in secondhand smoke exposure in the home by

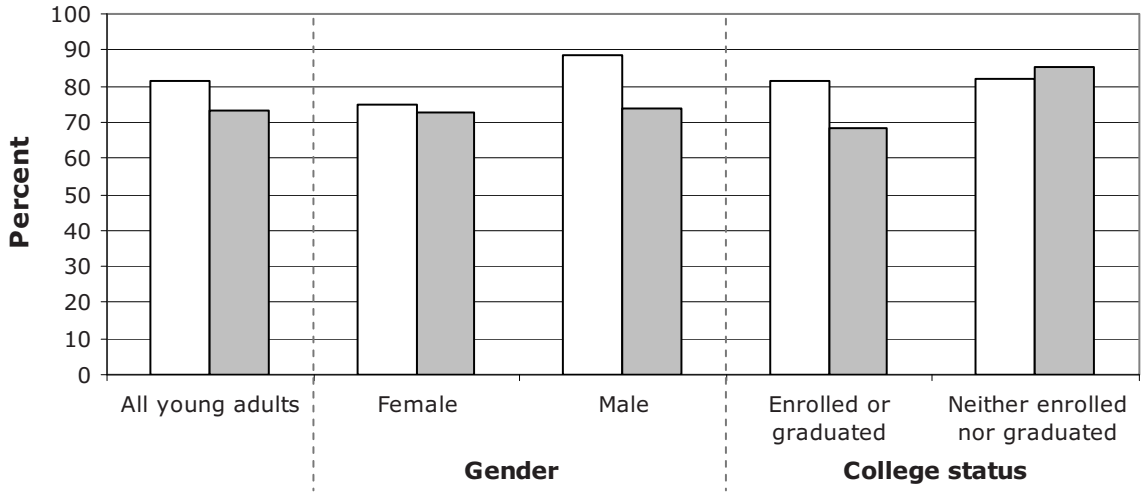
smoking status and college status. Young adult smokers (28.1±9.5 percent) are more likely to be exposed to secondhand smoke in the home than young adult nonsmokers (6.7±2.6 percent), a large and statistically significant difference. There is a similarly large and significant difference by college status: young adults in the college group (7.8±3.9 percent) are less likely to be exposed to secondhand smoke at home than the non-college group (24.7±8.5 percent).

5.11.5 Secondhand Smoke Exposure among Young Adults, 2003 to 2007

Exposure to secondhand smoke in any location has declined among young adults from 2003 to 2007. In 2003, 81.7±3.7 percent of young adults were exposed to secondhand smoke in the past seven days (Figure 5-7). This declined by 8.4±6.3 percentage points to 73.2±5.1 percent in 2007, a statistically significant change. The decrease was even larger among men (14.6±8.5 percentage points). The decrease for the college group was statistically significant (13.2±8.2), but there was no difference for the non-college group.

Exposure to secondhand smoke in the community (in a place other than work, car or home) declined between 2003 and 2007. In 2003, 71.7±4.6 percent of young adults were exposed to secondhand smoke in the community, compared with 58.3±5.3 percent in 2007 (Figure 5-8). This decline of 13.4±7.0 percentage points is statistically significant.

Figure 5-7. Seven-day exposure to secondhand smoke in any location among young adults, by selected demographic characteristics, from 2003 to 2007



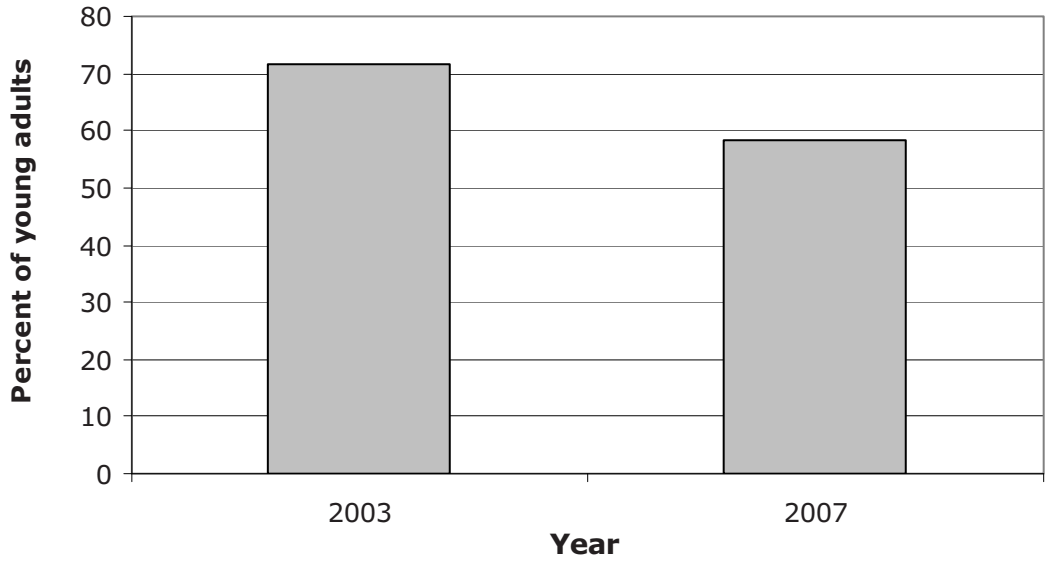
Year of survey	All young adults	Demographic characteristics			
		Gender		College status	
		Female	Male	Enrolled or graduated	Neither enrolled nor graduated
2003	81.7 ± 3.7	74.7 ± 6.0	88.6 ± 3.8	81.4 ± 4.4	81.7 ± 7.1
2007	73.2 ± 5.1	72.5 ± 6.8	73.9 ± 7.6	68.2 ± 7.0	85.2 ± 5.7
Change over time 2003 to 2007	-8.4 ± 6.3 %*	-2.3 ± 9.1 %	-14.6 ± 8.5 %*	-13.2 ± 8.2 %*	3.4 ± 9.1 %

Note: In 2007, MATS asked a general question about secondhand smoke exposure in any place other than work, car or home. In 2003, MATS asked about exposure in any place other than work or home. These questions are components of the MATS overall measure of secondhand smoke in any location, so interpreting changes in these measures from 2003 and 2007 must be done with caution.

* Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

Figure 5-8. Seven-day exposure to secondhand smoke in the community at large among young adults, from 2003 to 2007



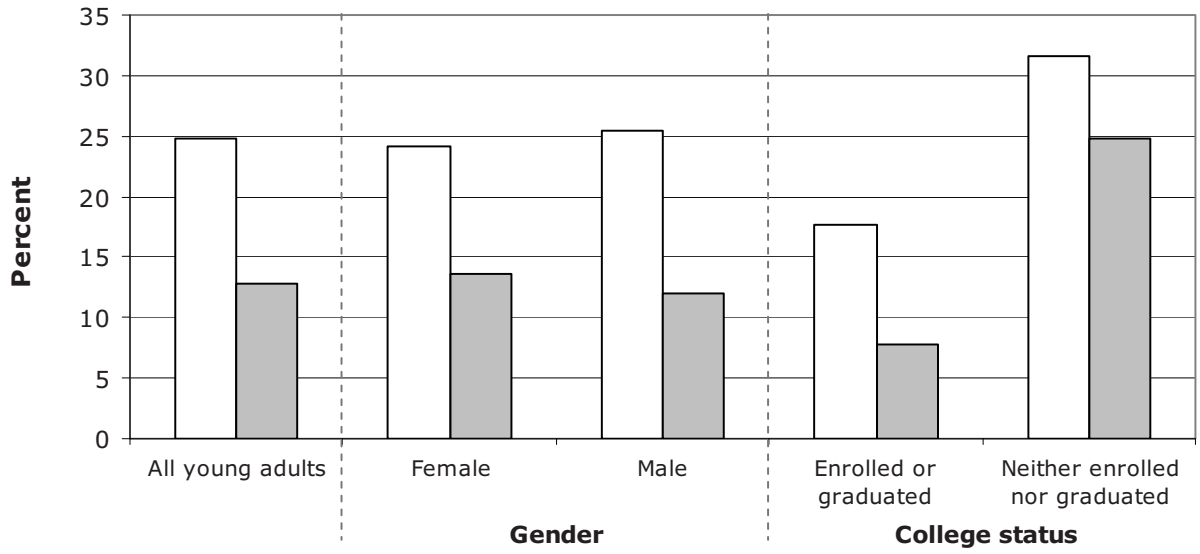
			Change over time
	2003	2007	2003 to 2007
Exposed to secondhand smoke in the community at large	71.7 ± 4.6	58.3 ± 5.3	-13.4 ± 7.0 %*

* Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Surveys, 2003 and 2007

Exposure to secondhand smoke at home in the past seven days declined significantly among young adults from 2003 to 2007. In 2003, 24.9±3.8 percent of young adults were exposed to secondhand smoke at home (Figure 5-9). By 2007, this declined by 12.1±5.2 percentage points to 12.8±3.5 percent. There were statistically significant declines among men (13.5±7.8 percentage points), women (10.6±7.0 percentage points), and the college group (10.0±5.9 percentage points).

Figure 5-9. Seven-day exposure to secondhand smoke at home among young adults, by selected demographic characteristics, from 2003 to 2007



Year	All young adults	Demographic characteristics			
		Gender		College status	
		Female	Male	Enrolled or graduated	Neither enrolled nor graduated
2003	24.9 ± 3.8	24.2 ± 5.0	25.5 ± 5.8	17.7 ± 4.5	31.6 ± 7.0
2007	12.8 ± 3.5	13.6 ± 4.8	12.0 ± 5.2	7.8 ± 3.9	24.7 ± 8.5
Change over time 2003 to 2007	-12.1 ± 5.2 %*	-10.6 ± 6.9 %*	-13.5 ± 7.8 %*	-10.0 ± 5.9 %*	-6.8 ± 11.1 %

*Statistically significant at the 95% confidence level

Source: Minnesota Adult Tobacco Survey, 2003 and 2007

Exposure to secondhand smoke at work in the past seven days remained essentially unchanged among young adults from 2003 to 2007. In 2003, 29.7±4.9 percent of young adults were exposed to secondhand smoke at work, while in 2007 23.2±4.9 percent were. There were no statistically significant differences by gender or college status. Similarly, exposure to secondhand smoke in a car in the past seven days did not change significantly. In 2003, 44.5±4.6 percent of young adults were exposed in a car, compared with 41.4±5.1 percent in 2007.

5.12 Smoke-free Policies and Their Association with Exposure at Work and at Home among Young Adults

Young adults with smoke-free policies in their work areas and indoor common areas face less exposure to secondhand smoke in their work area than those without such policies. Among those young adults who say that smoking is not allowed in work areas, 9.4±4.2 percent say that someone has smoked in their work area in the past seven days (Table 5-31). By comparison, among young adults who say that smoking is allowed in some or all work areas, over five times as many (53.8±12.1 percent) say that someone has smoked in their work area. The presence of a smoking prohibition in the work area is significantly associated ($p<0.05$) with lower rates of secondhand smoke exposure at work. This section uses concepts and definitions described in section 4.6

Table 5-31. Young adults exposed to secondhand smoke in own work area in the past seven days, by the presence or absence of a smoke-free policy for work areas

Smoke-free policy for work areas	7-day exposure to secondhand smoke in own work area		
	Yes	No	Row total
	%	%	%
Yes	**9.4** ± 4.2	**90.6** ± 4.2	100
No	**53.8** ± 12.1	**46.2** ± 12.1	100

Source: Minnesota Adult Tobacco Survey, 2007

Young adults with policies prohibiting smoking inside the home are similarly protected from secondhand smoke. Among those young adults with a rule in their house prohibiting smoking inside the home, 3.7±2.5 percent report that someone has smoked in their home in the past seven days (Table 5-32). In contrast, among the young adult Minnesotans who do not have such a rule, 77.8±9.6 percent say that someone has smoked in their home in the past seven days. The existence of a smoking prohibition is significantly associated ($p<0.05$) with lower rates of smoking in the home.

Table 5-32. Young adults exposed to secondhand smoke inside the home in the past seven days, by the presence or absence of a smoke-free rule inside the home

Smoke-free policy inside home	7-day exposure to secondhand smoke inside home		
	Yes	No	Row total
	%	%	%
Yes	**3.7** ± 2.5	**96.3** ± 2.5	**100**
No	**77.8** ± 9.6	**22.2** ± 9.6	**100**

Source: Minnesota Adult Tobacco Survey, 2007

5.13 Key Findings

Some of the most important findings from this chapter are summarized below. All differences presented in this summary are statistically significant at the 0.05 confidence level unless otherwise noted.

Key Young Adult Findings for 2007

- Overall, 28.4±4.8 percent of young adults have smoked in the past 30 days.
- Among all young adults, 23.0±6.1 percent of the college group are smokers, while 41.1±9.6 percent of the non-college group are smokers.
- Among all young adults, 32.9±5.1 percent use some form of tobacco; 46.3±9.9 percent of the non-college group and 41.6±7.6 percent of men are tobacco users, each higher compared with the college group and women, respectively.
- Almost 10 percent (9.2±3.5 percent) of young adults in Minnesota are current users of one or more non-cigarette tobacco products. Slightly more than 17 percent (17.1±6.3 percent) of young men use some non-cigarette form of tobacco, while less than 1 percent (0.8±0.7 percent) of young women do.

- More than 15 percent (16.8±7.6 percent) of young adult smokers also use some other form of tobacco, which is about double the rate among all young adults. Among young male smokers, 26.4±11.8 percent use another form of tobacco, while only 1.8±1.6 percent of young female smokers use another form of tobacco.

- Nearly one in five (19.0±7.7 percent) young adult smokers smoked their first cigarette at or after age 18; slightly more than one-third (34.5±9.7 percent) became regular smokers at or after age 18.

- Overall, 63.1±9.5 percent of young adult smokers smoked on every day of the past 30 days. College status shows large and statistically significant differences. Nearly half (48.4±15.4 percent) of the college group smoked all 30 days and 80.0±10.1 percent of the non-college group did so.

- Young adult smokers smoke an average of 8.4±1.5 cigarettes per day on the days they smoke. Those in the college group smoke a mean of 5.3±1.2 cigarettes per day and those in the non-college group smoke a mean of 12.4±2.5 cigarettes per day.

- Among young adult smokers, 29.2±9.8 percent smoke their first cigarette of the day within 30 minutes of waking. Nearly all of the occasional smokers (95.4±7.6 percent) light their first cigarette at least 31 minutes after waking, compared with only 59.2±12.6 percent of the frequent smokers who wait that long.

- Among all young adult smokers, 28.9±8.9 percent do not consider themselves smokers. Nearly all (98.0±2.6 percent) frequent smokers consider themselves to be smokers, compared with only 14.3±11.2 percent of occasional smokers who see themselves as smokers.

- Young adult frequent smokers (72.0±10.0 percent) are over two times as likely to live with a smoker as occasional smokers (33.0±18.7 percent).

- Among young adult smokers, frequent smokers (55.4±12.1 percent) are much more likely than occasional smokers (10.0±8.1 percent) to say that at least half of the people close to them also use tobacco.

- Among young adult smokers, 42.4±9.8 percent are social smokers, smoking mainly when they are with other people. Occasional smokers are more likely than frequent smokers to be social smokers. Among frequent smokers, only 20.0±9.1 percent smoke mainly with other people, compared with 89.4±7.4 percent of occasional smokers.

- Over half (56.1±11.8 percent) of young adult smokers who had at least one drink in the past 30 days are more likely to smoke while drinking.

- In the past 12 months, 55.1±9.9 percent of current young adult smokers in Minnesota stopped smoking for one day or longer because they were trying to quit smoking. There is a large, but not statistically significant, difference between frequent and occasional smokers: 62.3±11.6 percent of frequent smokers made a quit attempt, but only 39.7±16.1 percent of occasional smokers did so.

- Nearly one-third (28.7±13.7 percent) of young adult established smokers used some form of assistance in their most recent attempt to quit smoking in the past 12 months. Nearly the same percentage of young adult established smokers (28.3±13.7 percent) used some form of quit medication, including 25.7±13.5 percent who used some form of NRT. Few young adult smokers (5.5±6.1 percent) used a prescription medication for their last quit attempt. Only 1.1±0.9 percent used any form of behavioral counseling.

- Among young adult smokers, 63.3±9.5 percent saw a doctor in the past 12 months; 81.2±12.1 percent of these were asked by a doctor if they smoked; and 64.6±15.3 percent were advised to quit. Those who received some form of referral in quitting represented 22.4±10.8 percent of those who visited a doctor.

- In response to the fee that raised the cost of a pack of cigarettes by 75 cents, 40.6±10.2 percent of young adult smokers thought about quitting, 30.4±9.7 percent cut down on cigarettes, and 33.8±10.1 percent made an attempt to quit.

- There is very high agreement among young adults that secondhand smoke exposure is harmful. Over 60 percent (61.8±5.1 percent) believe secondhand smoke is very harmful, and an additional 33.2±4.9 percent believe it is somewhat harmful.

- Among young adults, 44.2±5.2 percent say that a smoke-free workplace policy is very important, and an additional 32.3±5.2 percent say that it is somewhat important. Only 19.7±7.3 percent of young adult smokers assert that such a policy is very important compared with 53.8±6.3 percent of nonsmokers.

- Most young adults (73.8±5.2 percent) would prefer that smoking was not allowed in their own work area. Only 43.2±11.2 percent of young adult smokers prefer a smoke-free work area compared with 85.8±4.1 percent of nonsmokers.

- Smoking is prohibited in the work areas of 69.2±5.9 percent of young adult Minnesotans who work outside their home. Over 80 percent (82.6±6.5 percent) of young adult women are covered by a workplace smoke-free policy, compared with 56.6±9.1 percent of young adult men.

- Among all young adult Minnesotans, 87.5±3.1 percent live where there is a rule prohibiting smoking inside the home.

- Over 70 percent (73.2±5.1 percent) of young adult Minnesotans were exposed to secondhand smoke in any location over the past seven days, much higher than the overall percent of all Minnesotans exposed (56.7±1.6 percent). Young adults who are not in the college group (85.2±5.7 percent) are significantly more likely to be exposed to secondhand smoke than those who are in the college group (68.2±7.0 percent).

- Young adults are more likely to be exposed to secondhand smoke in the community at large[†] (58.3±5.3 percent) than at work (22.9±4.9 percent), in a car (41.4±5.1 percent), or at home (12.8±3.5 percent).

- Among all young adult Minnesotans, 12.8±3.5 percent say that someone has smoked cigarettes inside their home in the past seven days. Young adults in the college group (7.8±3.9 percent) are less likely to have been exposed to secondhand smoke at home than those in the non-college group (24.7±8.5 percent).

[†] Community exposure means the person is exposed to secondhand smoke somewhere other than work, a car or home.

- Young adults with policies prohibiting smoking inside the home are protected from secondhand smoke. Among those young adults with a rule prohibiting smoking inside the home, only 3.7±2.5 percent report that someone has smoked in their home in the past seven days. In contrast, among the young adults without such a rule, 77.8±9.6 percent say that someone has smoked in their home in the past seven days.

Key Young Adult Trend Findings from 2003 to 2007

- Overall young adult smoking in Minnesota declined by 8.4±6.5 percentage points, from 36.8±4.3 percent in 2003 to 28.4±4.8 percent in 2007.

- Among the college group, smoking prevalence fell from 30.5±5.7 percent in 2003 to 23.0±6.1 percent in 2007, but that difference was not statistically significant. The smoking rate for the non-college group showed no change, at about 40 percent in both 2003 and 2007.

- Between 2003 and 2007, the percentage of young adult smokers who initiated smoking after age 18 doubled, from 9.2±3.8 percent in 2003 to 19.0±7.7 percent in 2007.

- In 2003, 38.9±4.6 percent of young adults lived with a smoker. By 2007, this declined by 10.4±6.6 percentage points to 28.6±4.8 percent. In contrast, the percentage of young adult smokers who live with a smoker remained constant, at close to 60 percent.

- The percentage of young adults covered by smoke-free policies in work areas and indoor common areas remained essentially unchanged between 2003 and 2007, at 59.2±5.0 percent and 64.3±6.1 percent, respectively. However, there was an increase in the percentage of young adult women covered by a smoke-free policy at work, increasing 11.1±9.6 percentage points between 2003 (66.5±6.1 percent) and 2007 (77.6±7.4 percent). There were increases in coverage for young adult smokers, from 48.9±8.2 percent in 2003 to 63.5±11.1 percent in 2007.

- The percentage of young adults covered by smoke-free policies in their homes increased between 2003 and 2007, from 72.2±4.0 percent to 87.5±3.1 percent. There were also increases among women (11.0±7.0 percentage

points), men (19.5±7.3 percentage points), the college group (13.8±7.4 percentage points) and young adult smokers (23.6±10.9 percentage points).

- In 2003, 81.7±3.7 percent of young adults were exposed to secondhand smoke in the past seven days. This declined by 8.4±6.3 percentage points to 73.2±5.1 percent in 2007.
- In 2003, 71.7±4.6 percent of young adults were exposed to secondhand smoke in the community (in some place other than work, car or home), compared with 58.3±5.3 percent in 2007, a decline of 13.4±7.0 percentage points.
- Exposure to secondhand smoke at work in the past seven days remained essentially unchanged among young adults from 2003 to 2007. In 2003, 29.7±4.9 percent of young adults were exposed to secondhand smoke at work, while in 2007 23.2±4.9 percent were exposed.
- In 2003, 24.9±3.8 percent of young adults were exposed to secondhand smoke at home. By 2007, this declined by 12.1±5.2 percentage points to 12.8±3.5 percent. There were declines among men (13.5±7.8 percentage points), women (10.6±7.0 percentage points), and the college group (10.0±5.9 percentage points).

5.14 Discussion

The sharp drop in reported smoking prevalence among young adults in just four years (from 36.8 percent in 2003 to 28.4 percent in 2007) is one of the most encouraging findings from MATS 2007. Several pieces of evidence corroborate this finding and may explain why this decline in young adult smoking has happened.

First, smoking among young adults is shaped in part by trends and developments in the teen years. Since the 2000 to 2003 Minnesota Youth Tobacco Prevention Initiative (MYTPI) and subsequent youth programs brought new resources and energy to tobacco prevention efforts, teen smoking rates have been declining. The percentage of Minnesota 12th-grade students who smoked in the previous 30 days fell from 34.6 percent in 2001 to 23.0 percent in 2007.[17] Therefore, fewer youth are now entering their young adult years as current smokers. Youth aged 12-17

exposed to MYTPI in 2001 would have been 18-23 years old at the time of MATS 2007.

Second, studies conducted by the University of Minnesota have also found reductions in tobacco use among college students in recent years. For example, the percentage of 18-24-year-old students at the University of Minnesota Twin Cities campus who used tobacco in the previous 30 days fell from 32.4 percent in 2003 to 20.9 percent in 2007.[18] Since MATS 2003, many colleges and universities have adopted campus-wide smoke-free policies. Future MATS will monitor the impact these policies have on smoking rates among young adults.

Third, Minnesota increased the cost of cigarettes by 75 cents per pack when a health impact fee went into effect in 2005. Increasing the cost of cigarettes has been shown to reduce smoking rates, especially among young people.[19] Indeed, 30.4±9.7 percent of young adult smokers report that the 2005 cost increase helped them cut down on cigarettes and 33.8±10.1 percent say it helped them make a quit attempt. In addition, several Minnesota cities and counties enacted smoke-free ordinances between 2003 and 2007. These ordinances barred smoking in restaurants, and, in some of these jurisdictions, bars as well. These ordinances may have discouraged some young people from taking up smoking by making smoking less acceptable in public places.

The decline in young adult smoking has been accompanied by an impressive drop in reported exposure to secondhand smoke, both in general and specifically in homes and in the community at large. As the smoking rate declines, young adults may encounter fewer smokers, especially among their age peers. Fewer young adults are now living with someone who smokes. In addition, the adoption of local smoke-free ordinances in restaurants and bars, and an increase in households with young adults that voluntarily prohibit smoking inside the home, have reduced opportunities for exposure.

The good news described previously must be balanced against a sober assessment of the challenges that stand in the way of further reductions in smoking and secondhand smoke exposure. Despite all the progress already noted, young adults

still have the highest smoking rates and the most widespread exposure to secondhand smoke of any adult age group.

While young adult smoking rates declined overall, the percentage of young adult smokers who initiated smoking after age 18 doubled since 2003. This finding tests the long-held belief that a young person is unlikely to try smoking if he or she has not done so before turning 18. This trend in delayed initiation will need to be monitored.

One area of particular concern is the unevenness in the decline of smoking prevalence. Non-college young adults have higher smoking rates than those currently attending college (or who have already graduated). In addition, the smoking rate for non-college young adults did not decline at all between 2003 and 2007 while it did appear to decrease for college young adults (although the decrease did not quite reach statistical significance). Similarly, exposure to secondhand smoke has declined significantly among college young adults, but not at all among non-college young adults. More needs to be done to understand and address the smoking orientation of this segment of the young adult population.

Another concern is the sizable proportion (42 percent) of young adult smokers who are social smokers, defined as those who smoke mainly when they are with other people. Many social smokers do not think of themselves as smokers and may feel they are not at risk because they confine their smoking to social situations. In their view, they control their smoking. They underestimate the addictive power of cigarettes and the difficulties that social situations can place on the path to quitting. Some will escalate their smoking and become regular users. Effective messages that whittle away at the erroneous assumptions made by social smokers are needed.

Young adult smokers in general are more likely than older smokers to be surrounded by people who smoke. Sixty percent (59.5±9.3 percent) live with another smoker, and 40.9±9.9 percent report that half or more of the people close to them are also tobacco users. The presence of other smokers in their lives provides many more opportunities to smoke and can make quitting or maintaining a quit attempt much harder.

Young adult smokers, by and large, have not reached the stage in life where they realize they may need help to quit. Young adult smokers are just as likely to try to quit as older smokers but they believe they can quit without help, specifically without the help of medications like the nicotine patch or prescription drugs. Older smokers, who may have been trying to quit for some time, are more likely to realize that medications can help them succeed in quitting. As a result, only one-fourth of young adult smokers use medications when they try to quit, compared with half of older smokers. Campaigns that can make evidence-based assistance attractive to young smokers are greatly needed.

As MATS 2007 and other studies show, a remarkable period of major declines in smoking by young people, both adolescents and young adults, is occurring. Comprehensive programs to prevent youth smoking have contributed to this decline and have been augmented by recent policy changes such as the 75-cent health impact fee and the passage of smoke-free local ordinances. However, the fluctuations in funding levels and changes in program strategies that have taken place in recent years may affect whether these positive trends, at least in the long run, are sustainable. Meanwhile, the tobacco industry is developing new products and promotions aimed at recapturing the youth market. Organizations interested in tobacco prevention cannot rest on past successes, but need to revitalize their efforts to ensure that smoking by adolescents and young adults continues to fall.

Finally, it is important to acknowledge the difficulties of continuing to track the thoughts and behaviors of young adults using standard survey sampling methods. In recent years, researchers have noticed a sharp rise in the number of young adults who have cell phones but no land-based telephone. In the United States, the percentage of 18-24-year-olds who live in cell phone-only households rose from 6.0 percent in the first half of 2003 to 30.6 percent in the second half of 2007.[20] While methods are currently changing at a rapid pace, cell phones are generally excluded from random-digit dialed phone surveys, including MATS. The latest national research finds that young adults with cell phones-only are somewhat more likely to smoke than young adults with land-based phones. According to this research, if cell phone-only households could be included in phone surveys, the smoking rate for young adults would be an estimated 1 to 1.5 percentage points higher than the rate

found through current surveys.[21] Even if MATS 2007 results were adjusted according to this national study, the important finding that smoking among young adults in Minnesota has fallen sharply would still be true. While these issues do not threaten the integrity of the current MATS findings, there will be a continuing need to monitor and find alternative approaches that address such issues to the extent possible in future surveys.

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Appendix A

Table A-1. Comparison of established† young adult smokers to all other smokers on selected behavioral, attitudinal and environmental characteristics

Characteristics	Indicator	Young adult smokers (18 - 24 years old)	Older adult smokers (25 or older)
		%	%
Smoking behavior			
Frequency	Smoked every day in past 30 days	**83.0** ± 7.7	**82.3** ± 3.5
Intensity	Mean cigarettes per day	**10.7** ± 1.8	**14.4** ± 0.9
Addiction	First cigarette smoked within 30 minutes of waking	**36.8** ± 11.7	**47.9** ± 5.1
Smoking attitudes			
Self-image	Consider themselves smokers	**88.9** ± 6.1	**92.4** ± 2.2
Perceived harm	Believe smoking an occasional cigarette is harmful	**56.3** ± 11.1	**62.0** ± 5.0
Perceived benefit	Believe smoking makes people more comfortable in social situations	**46.7** ± 11.4	**53.2** ± 5.2
Environment and social influences			
Home environment	Smoking not allowed anywhere in the home	**70.6** ± 10.2	**45.9** ± 5.0
	Live with a smoker	**68.3** ± 9.7	**42.9** ± 5.2
Social environment	Gave away a cigarette to friend in past 30 days	**94.6** ± 3.1	**68.1** ± 4.6
Smoking settings and cues	Smoke mainly when with other people	**26.9** ± 9.4	**17.5** ± 3.6
	Smoke mainly when alone	**4.9** ± 4.5	**21.8** ± 3.4
	More likely to smoke while drinking (among those who have had a drink in the past 30 days)	**52.3** ± 13.5	**29.0** ± 5.1
Quitting behaviors and beliefs			
Desire	Tried to quit in past 12 months	**61.1** ± 10.9	**50.8** ± 5.1
Quitting - treatment			
Use of assistance	Used any form of assistance when tried to quit in past 12 months	**28.7** ± 13.7	**52.8** ± 6.9
	Used any form of quit-smoking medication when tried to quit in past 12 months	**28.3** ± 13.7	**49.2** ± 6.8
	Used prescription quit-smoking medication when tried to quit in past 12 months	**5.5** ± 6.1	**17.5** ± 4.7
	Used behavioral therapy when tried to quit in past 12 months	**1.1** ±0.9	**17.9** ± 4.8
Attitudes toward assistance	Willing to use any form of assistance	**58.2** ± 11.7	**73.0** ± 4.6
	Believe they can quit without aid of medication	**85.3** ± 8.7	**48.7** ± 6.9
	Believe they are too unknowledgable about medications to use them properly	**55.2** ± 15.7	**41.0** ± 6.6
Health care services			
Medical care	Saw a doctor in past 12 months	**60.9** ± 11.2	**69.9** ± 4.9
Smoking intervention	Advised not to smoke by a doctor they saw in past 12 months	**62.0** ± 15.7	**77.7** ± 4.4

† Defined by the standard CDC measure described in section 2.2.1

Source: Minnesota Adult Tobacco Survey, 2007

Table A-2. Comparison of young adults to all other adults on selected environmental characteristics

Characteristics	Indicator	Young adults (18 - 24 years old)	Older adults (25 or older)
		%	%
Environment			
Home environment	Live with a smoker	**28.6** ± 4.8	**16.0** ± 1.5
Exposure to secondhand smoke			
At work	Someone smoked in work area, past 7 days	**23.2** ± 4.9	**13.3** ± 1.7
At home	Anyone smoked tobacco products in home, past 7 days	**12.8** ± 3.5	**11.9** ± 1.3
In a car	Been in car with someone smoking, past 7 days	**41.4** ± 5.1	**17.7** ± 1.5
In the community at large	Someone smoked near the person anywhere but home, work, car, past 7 days	**58.3** ± 5.3	**44.3** ± 1.7
Smoke-free policies			
At work	Smoking not allowed in work areas and indoor common areas	**64.3** ± 6.1	**77.9** ± 2.0
At home	Smoking not allowed at home	**87.5** ± 3.1	**82.6** ± 1.4
Secondhand smoke perceptions			
Perceived harmfulness of secondhand smoke	Very or somewhat harmful	**94.2** ± 2.3	**92.9** ± 0.8
Perceived importance of smoke free policies at all workplaces	Very important	**44.2** ± 5.2	**62.0** ± 1.7
	Somewhat important	**32.3** ± 5.2	**18.7** ± 1.4
Preference for smoke-free policies in own work areas	Not allowed	**73.8** ± 5.2	**80.9** ± 2.0
	No difference	**23.7** ± 4.9	**17.0** ± 1.9

Source: Minnesota Adult Tobacco Survey, 2007

Table A-3. Comparison of selected demographic, smoking behavior and history, and social indicators between young adults who are 30-day established smokers, 30-day unrecognized smokers, and all young adults

Characteristics	30-Day Established %	30-Day Unrecognized %	All Young Adults %
Demographic			
Gender			
Female	**42.9** ± 11.4	**28.0** ± 14.7	**51.9** ± 5.3
Male	**57.1** ± 11.4	**72.0** ± 14.7	**48.1** ± 5.3
College status			
Enrolled or graduated	**45.6** ± 12.4	**78.4** ± 14.9	**67.1** ± 5.3
Neither enrolled nor graduated	**54.4** ± 12.4	**21.7** ± 14.9	**32.9** ± 5.3
Smoking characteristics			
Number of days smoked in last 30 days			
1 Day	**0.5** ± 0.5	**54.6** ± 19.7	**N/A**
2 - 5 Days	**4.4** ± 4.6	**30.8** ± 16.8	**N/A**
6 - 9 Days	**3.2** ± 3.2	**7.0** ± 9.4	**N/A**
10 - 19 Days	**2.5** ± 1.5	**4.8** ± 7.8	**N/A**
20 - 29 Days	**6.4** ± 6.0	**0.0** ± 0.0	**N/A**
30 Days	**83.0** ± 7.7	**2.8** ± 4.8	**N/A**
Mean number of cigarettes smoked per day	**10.4** ± 1.8	**0.3** ± 0.2	**N/A**
Consider self to be smoker	**89.0** ± 6.1	**16.9** ± 14.5	**N/A**
Time after waking to first cigarette			
Within 5 minutes	**14.1** ± 9.4	**0.0** ± 0.0	**N/A**
6 to 30 minutes	**22.7** ± 10.3	**6.0** ± 9.8	**N/A**
31 to 60 minutes	**20.8** ± 9.2	**2.7** ± 4.8	**N/A**
After 60 minutes	**42.4** ± 11.0	**91.4** ± 10.7	**N/A**
Smoke mainly when with other people	**26.9** ± 9.4	**88.8** ± 9.4	**N/A**
More likely to smoke while drinking	**52.3** ± 13.5	**74.6** ± 19.1	**N/A**
Usually buys own cigarettes	**87.1** ± 7.3	**26.3** ± 15.7	**N/A**
Usually gets cigarettes from another smoker	**12.9** ± 7.3	**73.7** ± 15.7	**N/A**

Continued on next page

Table A-3. Comparison of selected demographic, smoking behavior and history, and social indicators between young adults who are 30-day established smokers, 30-day unrecognized smokers, and all young adults (continued)

Characteristics	30-Day Established %	30-Day Unrecognized %	All Young Adults %
Smoking history			
Age at first cigarette			
11 years or younger	**11.5** ± 9.0	**10.2** ± 12.6	**N/A**
12 to 14 years old	**42.6** ± 11.4	**33.9** ± 22.4	**N/A**
15 to 17 years old	**31.5** ± 10.5	**23.2** ± 13.0	**N/A**
18 to 20 years old	**14.2** ± 8.5	**32.4** ± 17.9	**N/A**
21 years old or older	**0.2** ± 0.3	**0.4** ± 0.8	**N/A**
Age when started smoking regularly			
11 years or younger	**0.9** ± 1.7	**0.0** ± 0.0	**N/A**
12 to 14 years old	**14.6** ± 9.6	**8.4** ± 11.6	**N/A**
15 to 17 years old	**40.1** ± 11.1	**12.6** ± 11.4	**N/A**
18 to 20 years old	**42.1** ± 11.6	**8.9** ± 9.4	**N/A**
21 years old or older	**0.5** ± 0.5	**1.2** ± 1.4	**N/A**
Never smoked regularly	**1.9** ± 2.1	**68.9** ± 17.5	**N/A**
Current use of tobacco products other than cigarettes[†]			
Smokeless tobacco	**7.0** ± 4.2	**8.7** ± 9.9	**4.3** ± 1.9
Cigar	**11.4** ± 8.9	**8.6** ± 8.8	**4.5** ± 2.3
Any tobacco products other than cigarettes	**16.7** ± 9.3	**17.0** ± 3.0	**9.2** ± 3.5
Social influences			
Live with a smoker	**68.2** ± 9.7	**33.0** ± 22.0	**28.6** ± 4.8
Half or more people close to the person use tobacco	**49.8** ± 11.4	**13.8** ± 11.3	**17.6** ± 3.9
Was offered a cigarette in the past 30 days	**82.6** ± 7.4	**77.8** ± 14.5	**34.5** ± 5.0
Any exposure to secondhand smoke in past 7 days (any location)	**95.7** ± 4.6	**85.8** ± 15.1	**73.2** ± 5.1
Smoke-free policies			
Smoking not allowed in work areas and indoor common areas at work	**70.8** ± 11.3	**68.3** ± 20.7	**64.3** ± 6.1
Smoking not allowed in home	**70.7** ± 10.2	**89.9** ± 9.3	**87.5** ± 3.1

[†] Some cigarette smokers use these products in addition to cigarettes, while some non-cigarette smokers use these products but not cigarettes.

Source: Minnesota Adult Tobacco Survey, 2007

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