Tobacco Use Among Massachusetts Adults: Twenty Years of Progress 1986-2005

Results from the Behavioral Risk Factor Surveillance System

TOBACCO CONTROL PROGRAM
BUREAU FOR FAMILY HEALTH

HEALTH SURVEY PROGRAM
BUREAU OF HEALTH INFORMATION,
STATISTICS, RESEARCH, AND EVALUATION

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

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Make Smoking History

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OVERVIEW

We are pleased to present this report concerning tobacco use in the Commonwealth of Massachusetts. In the 20 years covered by this report, much progress has been made in reducing tobacco use in Massachusetts. For example, the current smoking rate among Massachusetts adults has never measured lower. It is, therefore, not surprising that exposure to secondhand smoke also has dropped significantly in recent years. Clearly, this is good news.

Before describing this report, it is important to note that since the BRFSS has focused on different issues over the years, not every question is asked in every survey. Whenever a question was asked annually, long-term trends were studied. In some cases, long-term trends for Massachusetts were compared to national trends. However, only a small set of core questions are asked by every state in every year. When long-term trends were available nationally and within the Commonwealth, these trends were compared.

If a trend analysis was not possible, a thorough examination of the current status of tobacco use and tobacco users was undertaken. To increase the stability of these estimates, several years of data were aggregated. Once again, data availability was a factor. The number of years aggregated and the most recent year included were a function of data availability. For example, the age at which respondents tried their first cigarette is available only for the years 2000 to 2002, whereas the percentage of adults who currently smoke is available for all 20 years.

This report targets several audiences. The body of the report presents information with accompanying charts in a user-friendly question-and-answer format which is directed at four major themes: socio-demographic patterns of smoking; smoking and disease; smoking behavior; and secondhand smoke. The public at large, as well as policy makers who are interested in summary patterns of cigarette smoking in Massachusetts over the past twenty years, should find this report informative. Researchers, students, and public health advocates, who need more comprehensive data may refer to the Appendix. The Appendix includes detailed statistical tables as well as other technical, explanatory information.

HIGHLIGHTS

20 Years of Progress

- **Smoking rates have declined steadily over the past 20 years in Massachusetts.**
- **Among college-educated adults in Massachusetts, smoking rates have been cut in half.**
- **Every year since 1997, the adult smoking rate in Massachusetts has been lower than the national rate.**
- **Since 2002, exposure to secondhand smoke has dropped significantly in Massachusetts.**
- **The percentage of adults who have a no-smoking rule in the home has nearly doubled in Massachusetts since 1992.**

Challenges for the Future

- **Massachusetts smokers are less likely than non-smokers to have health insurance and far more likely to have health problems.**
- **Disabled Massachusetts adults continue to smoke at significantly higher rates than the rest of the population.**
- **Lower socio-economic groups in Massachusetts also smoke at significantly higher rates than the rest of the population.**
- **Massachusetts adults who have ever smoked report significantly more diabetes, asthma, and hypertension than those who never smoked.**
- **Nearly one-quarter million children in Massachusetts live in homes where smoking is permitted.**

INTRODUCTION

The year 2005 marked the twentieth year in which the Behavioral Risk Factor Surveillance System (BRFSS) was conducted in the Commonwealth of Massachusetts. The BRFSS is a random-digit-dialed telephone survey administered to adults eighteen years and older. The BRFSS asks questions regarding smoking, drinking, exercising, and a variety of other health-related topics.

The survey was developed by the Centers for Disease Control (CDC) in the mid-1980's as a means to gather health statistics on a state by state basis. In that initial survey, fifteen states participated. Currently, all 50 states, the District of Columbia, and three territories participate annually.

The BRFSS is acknowledged as the primary source for tracking health risks in the United States. Massachusetts has collected 20 years of BRFSS data. This report will examine that data as it relates to smoking and its impact on the health of the citizens of the Commonwealth.

Smoking is the leading cause of preventable death in the Massachusetts.[1] Analysis of Massachusetts BRFSS data indicates that, despite decades of health warnings, nearly a million citizens of Massachusetts continue to smoke. Roughly 10,000 Massachusetts residents will die each year from smoking related causes[2], including 1,000 who will die from illnesses attributable to second-hand smoke.[3]

The risks posed by smoking are substantial. The Surgeon General of the United States first highlighted the risks of smoking over 40 years ago.[4] Yet, tobacco continues to kill more people each year than automobile accidents, AIDS, homicides, suicides, and poisonings combined.[5] Most alarmingly, 95% of smokers begin smoking in their teen years or younger.[6]

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[1] U.S. Department of Health and Human Services. *The health consequences of smoking: a report of the Surgeon General.* Atlanta, GA: Centers for Disease Control and Prevention, Office on Smoking and Health, 2004. Accessed 9/5/2006 on website at http://www.cdc.gov/tobacco/sgr/sgr_2004/index.htm.

[2] Carpenter, CM, Keithly, L, and West, J. *Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) Massachusetts 2001*. Boston, MA: Massachusetts Department of Public Health, Oct 1, 2004, p. 3. Accessed 5/15/2006 on website at http://www.mass.gov/dph/mtcp/reports/sammec_2004.pdf.

[3] U.S. figure is 53,000 deaths from lung cancer and ischemic heart disease due to secondhand smoke exposure. Glantz, S.A. and W.W. Parmley. 1995. "Passive Smoking and Heart Disease: Mechanisms and Risk". *Journal of the American Medical Association* 273(13):1 1047-1053. MA figure is 1,196 based on proportion of U.S. population.

[4] U.S. Department of Health and Human Services. *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service.* Atlanta, GA: Centers for Disease Control and Prevention, Office on Smoking and Health, 1964. Accessed 9/5/2006 on website at http://www.cdc.gov/tobacco/sgr /sgr_1964/sgr64.htm.

[5] Massachusetts Department of Public Health, "Massachusetts Deaths 2001", May 2003. Accessed on 7/6/2006 on website at http://www.mass.gov/Eeohhs2/docs/dph/research_epi death_report_2001.pdf. Data on Massachusetts deaths from motor vehicle accidents, AIDS, homicides, suicides, and poisonings.

[6] Massachusetts Department of Public Health, BRFSS, 2002.

In addition to taking an enormous toll in lives, smoking is also an incredibly expensive habit – not just for the smoker but for the entire Commonwealth. Tobacco-related illnesses cost the Massachusetts health care system $2.7 billion per year or $898 per taxpayer per year (in 1998 dollars).[7] Moreover, each five dollar pack of cigarettes costs over $14 in medical expenses and lost productivity.[8]

Over the past 20 years, smoking's toll in death, disease, and dollars has been enormous. It is hoped that this report can shed light on current trends in smoking and smoking's impact on the Commonwealth.

[7] Carpenter, CM, Keithly, L, and West, J. *Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) Massachusetts 2001*. Boston, MA: Massachusetts Department of Public Health, Oct 1, 2004, p. 3. Accessed 5/15/2006 on website at http://www.mass.gov/dph/mtcp/reports/sammec_2004.pdf. Smoking-attributable health care costs of $2.76 billion divided by 3,007,701 individual taxpayers is $898. The number of individual taxpayers accessed 5/16/2006 on website at http://www.bizstats.com/statereturns.htm.

[8] Centers for Disease Control and Prevention. *Sustaining State Programs for Tobacco Control: Data Highlights, 2004*, p. 10. Accessed 5/16/2006 on website at www.cdc.gov/tobacco/datahighlights/DataHighlights.pdf.

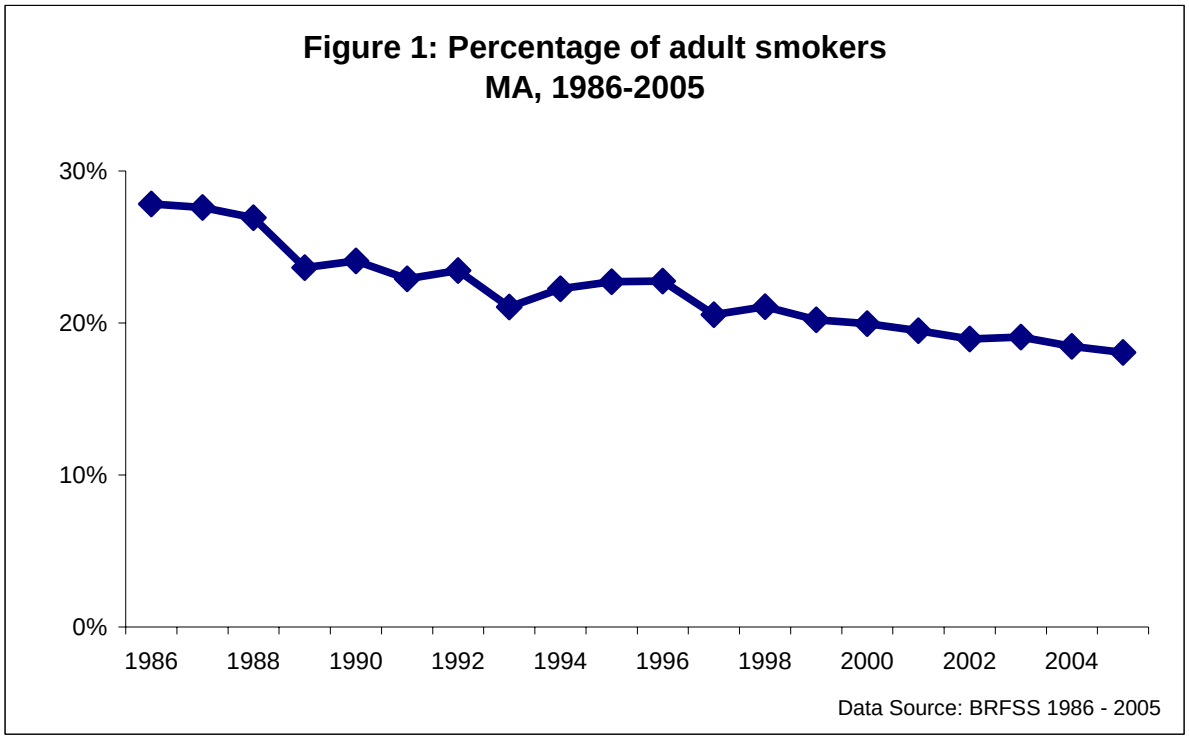
PART I: SOCIO-DEMOGRAPHICS OF SMOKING

1. Smoking Rates in Massachusetts (1986 to 2005)

Smoking rates over the past 20 years can be analyzed by comparing two specific points in time or by looking at trends over time. This report will present analyses using both methods. Trend analyses (see the explanation in the "Methods" section) are presented to describe annual changes in smoking habits since 1986. In some cases, a more in-depth look at the current state of smoking in the Commonwealth is presented. We hope that this combination of information will provide a deeper understanding of the public health challenges for the future.

Question: How have smoking rates changed in the last 20 years in Massachusetts?

Since the first BRFSS survey was conducted in Massachusetts in 1986, there has been a steady decline in the rate of adult smoking. In 1986, the rate was measured at 27.8%, translating into a total of 1.4 million adult smokers. By 2005, the rate had dropped to 18.1% or a reduction of over 500,000 smokers (Figure 1). However, this means that there were still approximately 900,000 adult smokers in Massachusetts in 2005 (Table 1).



2. Comparison of Massachusetts and U.S. Rates (1990 to 2005)

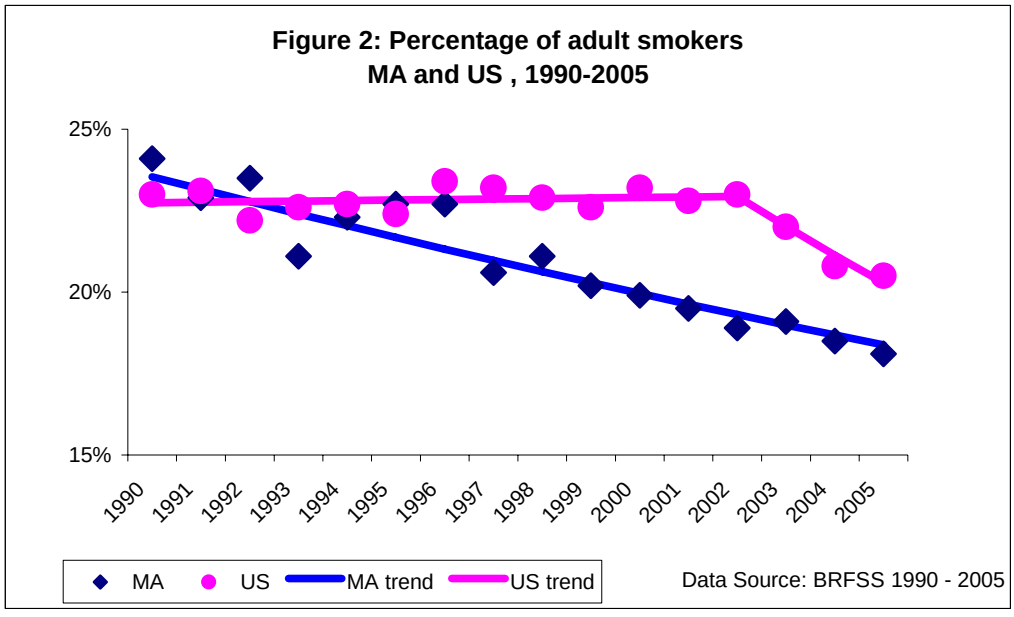
Question: How do smoking rates in Massachusetts compare to the rest of the country?

By 1990, a sufficient number of states participated in the BRFSS to yield a reliable national smoking rate. An analysis of the trend in smoking rates nationally and for the Commonwealth shows two distinct patterns (Figure 2).[9]

In 2005, the median rate of adult smoking nationally was 20.5%. The rate in Massachusetts was 18.1%. This difference, although statistically significant, is smaller than it was five years earlier.

Throughout the 1990's, adult smoking rates remained relatively unchanged in the US. Beginning in 2002, rates declined sharply. Since that time, trend analyses show that the population of adult smokers in the United States has dropped approximately 4% per year.

In comparison, the trend for adult smoking rates in Massachusetts is different. While smoking rates in Massachusetts have steadily decreased, the rate of decrease has been slower. In Massachusetts, the population of adult smokers has decreased by 1.8% per year since 1990 (Table 2). The difference between the two trends may be a function of funding; in 1993, Massachusetts began funding tobacco control at a level that was much higher than most other states. Many states did not actively fund tobacco control programs until funds became available from the Master Settlement Agreement which was signed in 1998.



[9] See the Methods Section for a detailed explanation of trend analysis.

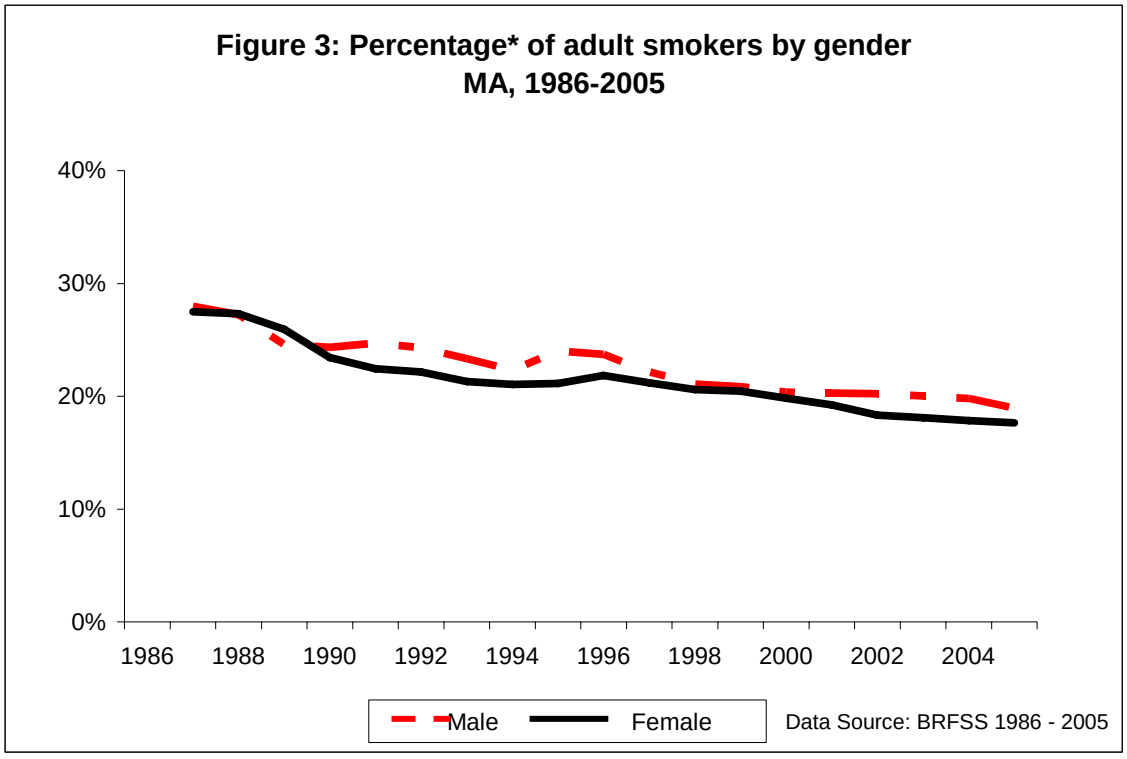
3. Socio-demographic patterns of smoking

Question: Do the smoking rates vary by social and demographic group?

Since 1986, smoking rates in Massachusetts have decreased in almost every major socio-demographic category including gender, age, and educational level. In many cases, the decrease within specific categories mirrors the drop in the overall rate of adult smoking.

a. Gender

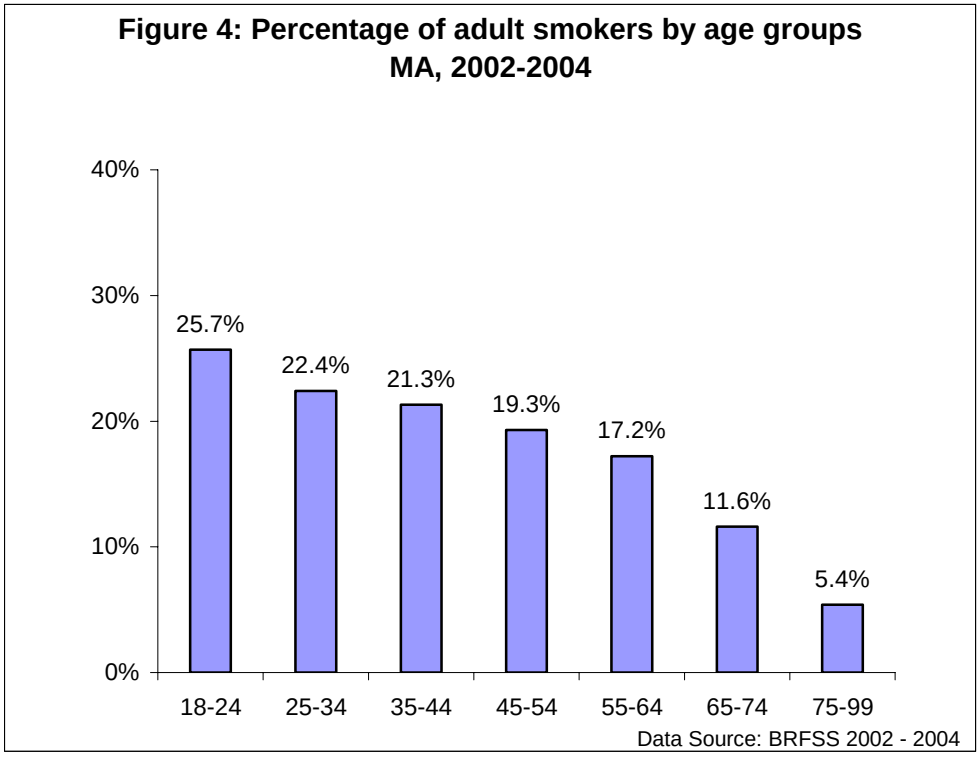
In 1986, 28.6% of adult men smoked compared to 18.2% in 2005. For women, the decrease was similar (Figure 3). In 1986, the rate of smoking among women was 27.1% decreasing to 17.9% in 2005. These small differences in smoking rates between men and women have never reached statistical significance for any individual year (Table 3).



*two years moving average

b. Age

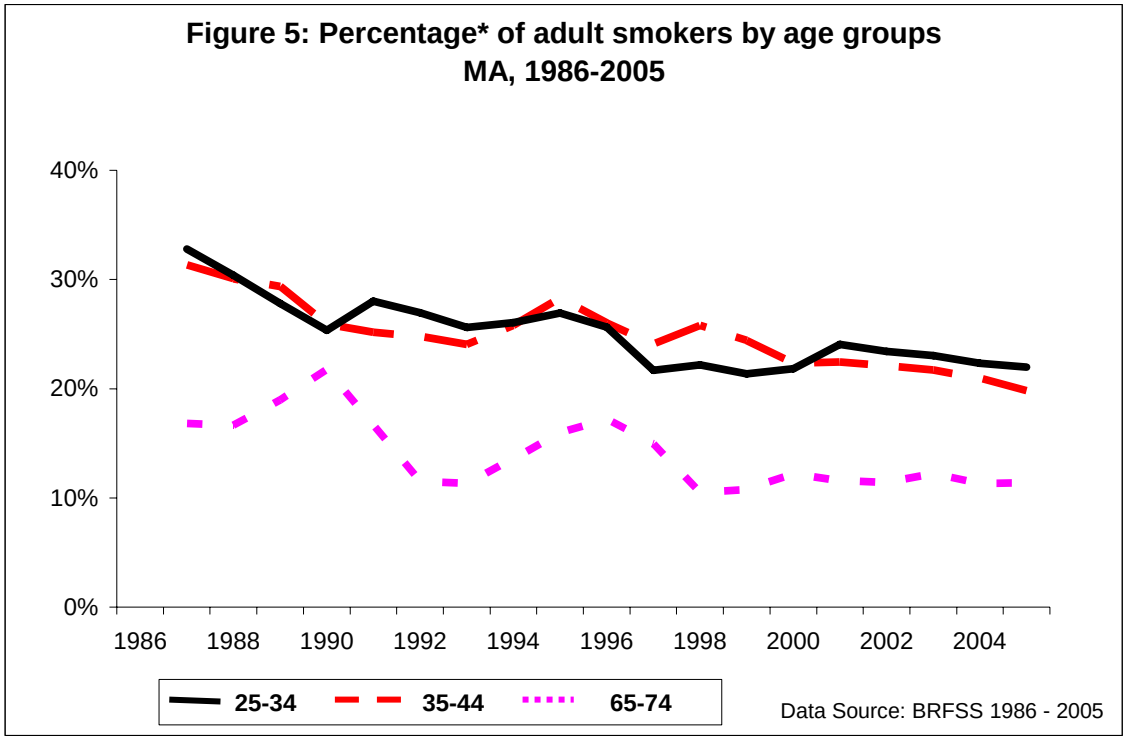
There is a clear relationship between age and smoking rate. A higher percentage of young adults smoke than do older adults (Figure 4 and Table 6). Due to small sample sizes, year-to-year smoking prevalence estimates can be quite variable when a narrow age range is being evaluated. Nonetheless, the smoking rate of individuals ages 18 – 24 was higher than the rate for those ages 65 – 74 in 12 of the 20 years analyzed. When compared to those 75 years old and older, the rate for young adults (18 – 24) was higher in 18 of the 20 years surveyed (Table 4).



A similar pattern of differences was found for the 25 – 34 and 35 – 44 year olds (Figure 5). Once again, the younger age groups have smoking prevalence rates that are higher than the older group (Figure 5 and Table 4).

The smoking rate is also dropping for 25 – 34 and 35 – 44 year olds. In fact, a trend analysis[10] showed that smoking rates have decreased significantly in every age group over the past 20 years, except for 18 – 24 year olds. For example, the number of smokers ages 45 – 54 has been dropping 2.3% per year since 1986. For 65 – 74 year olds, the annual decrease was 2.5%. There is no difference between the rates measured in 1986 and 2005 for 18 – 24 year olds.

[10] See the Methods Section for a detailed explanation of trend analysis.



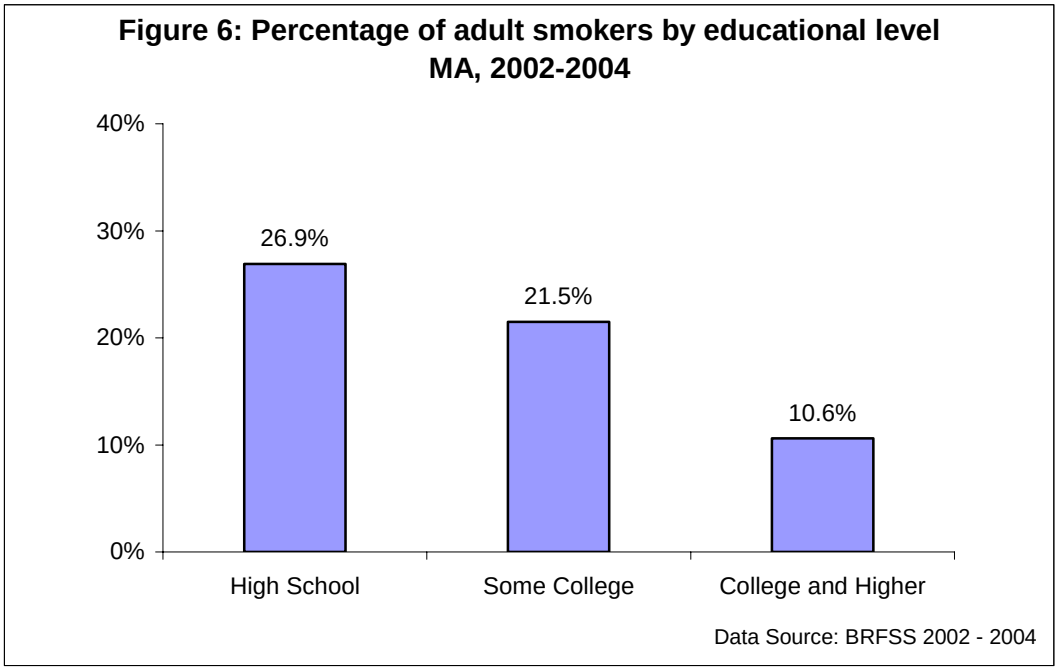
*two years moving average

The analysis of smoking rates by age groups, in conjunction with the trend analysis, demonstrates two things: first, the smoking rates for young adults remained significantly higher than the rates for older adults; and secondly, smoking rates have decreased significantly for all age groups since 1986, except for young adults, ages 18 – 24 (Table 4).

c. Educational Level

Massachusetts has a level of educational attainment that is substantially higher than the national average.[11] The 2000 U.S. Census determined that 35.8% of Massachusetts adults had completed college; this percentage is the highest in the nation.

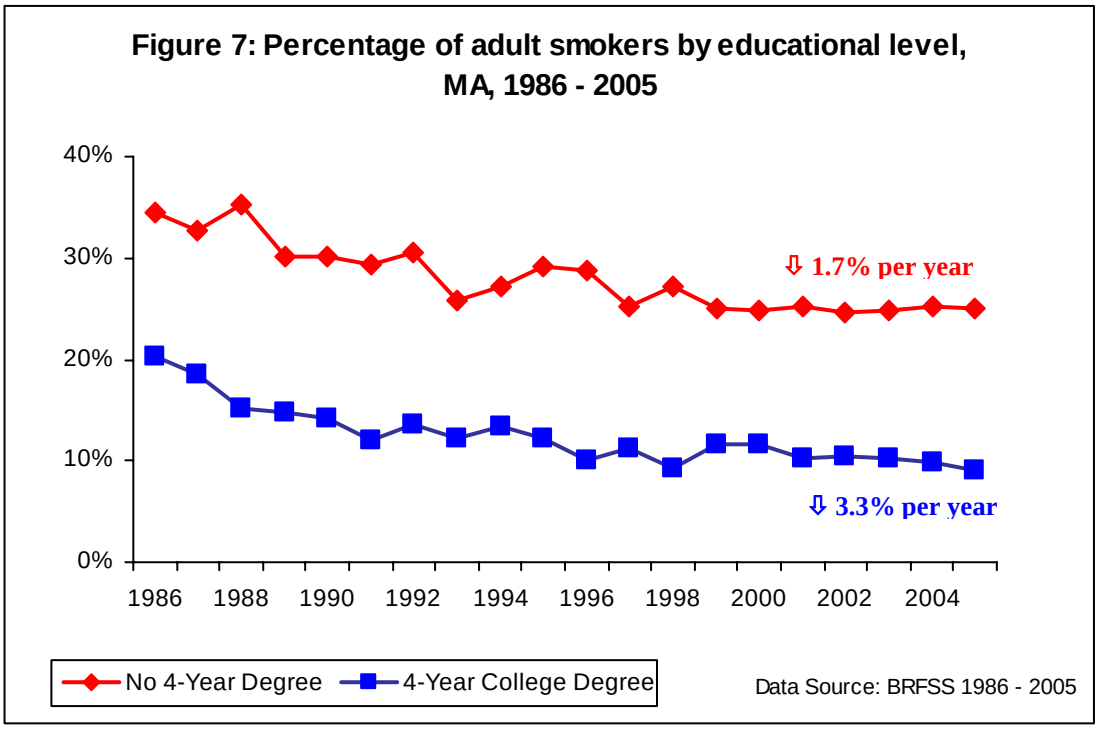
In the Commonwealth, smoking rates are lower for college-educated adults than for adults with less than a college degree (Figure 6 and Table 5). This result has been consistent throughout the 20 years of the BRFSS. Typically, small sample sizes make it less likely that differences between groups will be found when individual years are examined. Nonetheless, in every one of the 20 years that the BRFSS was conducted in Massachusetts, the smoking rate for individuals who had at least a college degree was lower than the rate for those persons who had less than a high school education. The smoking rate for college-educated adults was also lower than the rate for individuals with a high school degree or a G.E.D in each of the past 20 years (Table 6). The pattern was similar for adults who had attended college but had no 4-year degree. In summary, the difference in smoking rates between college-educated adults and other groups is both large and consistent.



The difference between the groups has grown larger over time. In 1986, the rate for college-educated adults was 20.2%, decreasing to 9.0% in 2005. Trend analysis[12] demonstrated that the number of college-educated adult smokers had decreased 3.3% per year since 1986 (Figure 7). For those with less than a college education, the annual decrease has been only 1.7%.

[11] U.S. Census Bureau; Census 2000, Summary File 1; generated by Thomas Land; using American FactFinder; <http://factfinder.census.gov>; (1 August 2006).
[12] See the Methods Section for a detailed explanation of trend analysis.

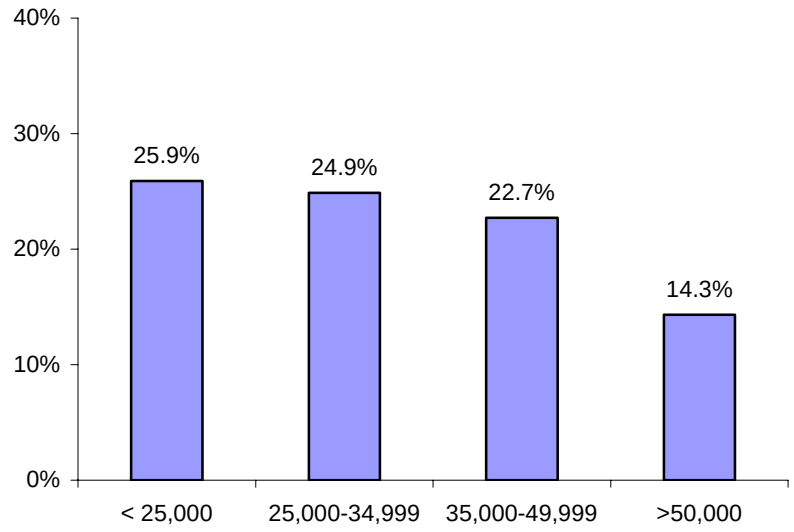
While it is encouraging that smoking rates for college-educated adults have dropped so rapidly since 1986, the same is not true for the remaining two-thirds of adults who do not have a college degree.



d. Annual Household Income

The differences seen in smoking prevalence by educational level are echoed in the data for annual household income level. Based on responses aggregated from 2002 to 2004, the smoking rate among adults whose annual household incomes were $50,000 or more was lower than that among adults whose annual household incomes were under $50,000. Smoking rates among adults with household incomes under $50,000 did not differ significantly from one another (Figure 8 and Table 5). This result may be partly a function of age, since older adults tend to have higher incomes as well as lower rates of smoking.

Figure 8: Percentage of adult smokers by annual household income, MA, 2002-2004

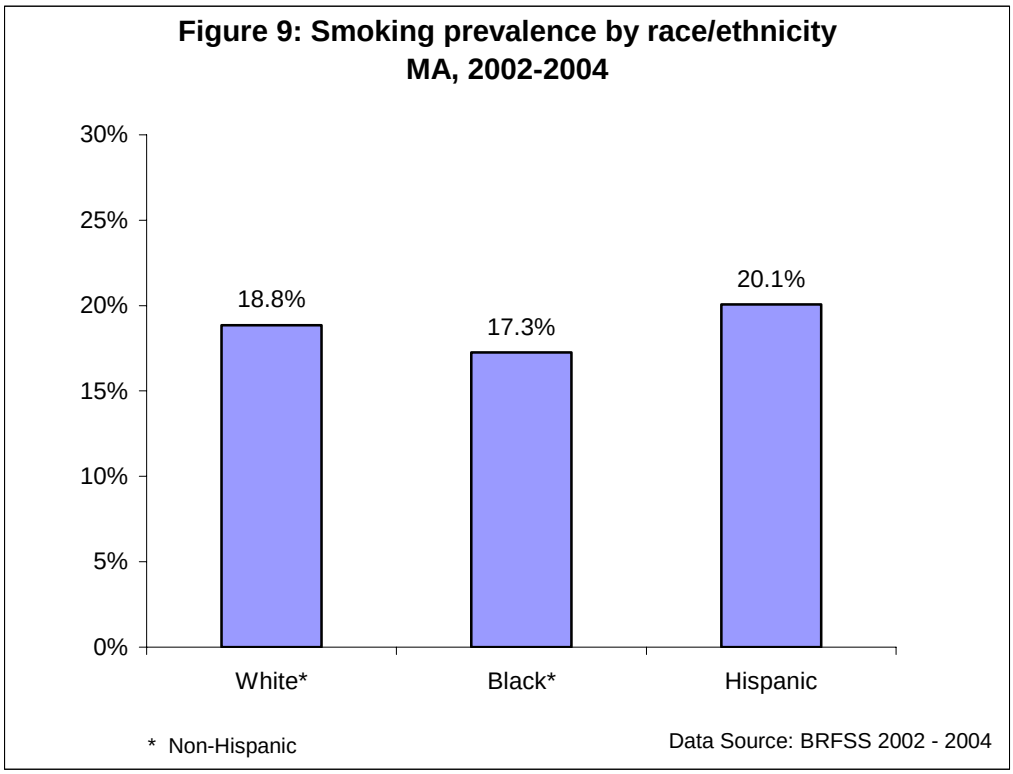


Data Source: BRFSS 2002 - 2004

e. Race/Ethnicity

Although the race-ethnicity composition of the Massachusetts population has been changing, the Commonwealth is still predominately White (non-Hispanic). In the 2000 United States Census, nearly 85% of residents listed their race as White.[13] Black, Hispanic, Asian, and all other categories make up the remaining 15%. Given that these population subgroups are relatively small, there is insufficient data to establish time trends in smoking prevalence among racial-ethnic groups across the 20 years of BRFSS surveys. Sufficient information does exist, however, to evaluate smoking prevalence between racial-ethnic groups by aggregating data from recent years.

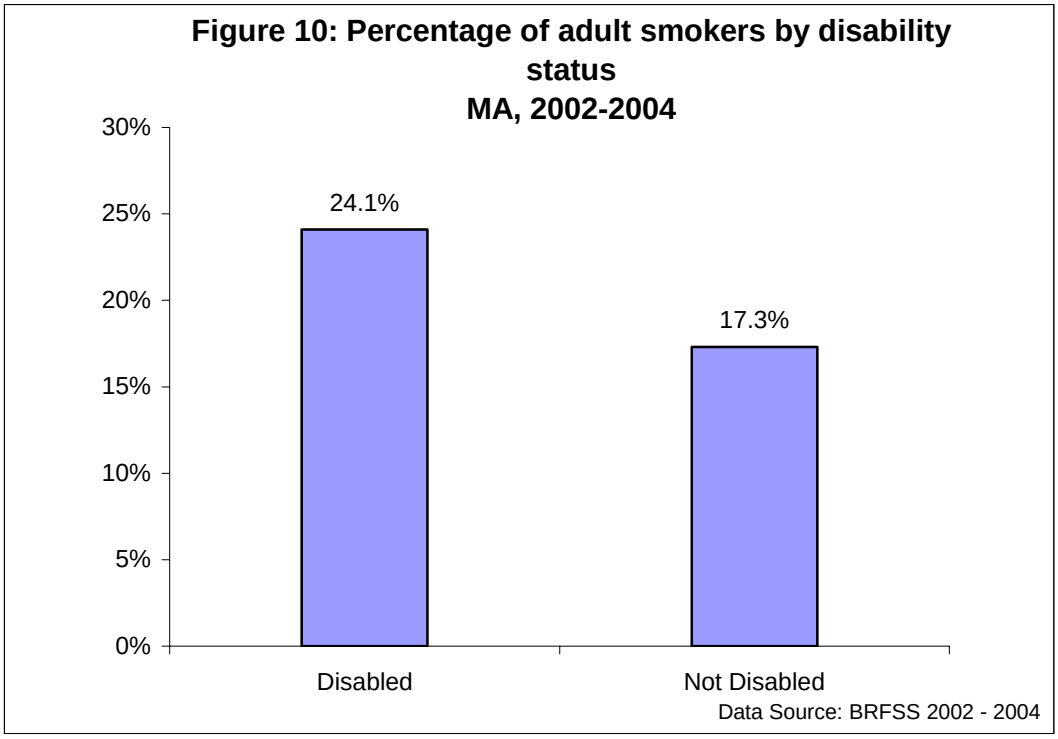
Based on responses from 2002 to 2004, the rate of adult smoking among White (non-Hispanic) adults was not statistically different than for Black (non-Hispanic) and Hispanic adults (Figure 9 and Table 5).



[13] U.S. Census Bureau; Census 2000, Summary File 1; generated by Thomas Land; using American FactFinder; <http://factfinder.census.gov>; (1 August 2006).

f. Disability

Questions about disabilities were not included in the BRFSS survey before 1998.[14] Therefore, sufficient data exists to evaluate smoking rates for the disabled only by aggregating responses for several years. Based on responses from 2002 to 2004, the rate of adult smoking among persons who reported having some type of disability was significantly higher than the rate for adults without reported disabilities (Figure 10). For the disabled, the rate was 24.1%; for those without a reported disability, the rate was 17.3%.



The socioeconomic patterns of smoking among the disabled are similar to those seen in the rest of the population (Figure 11 and Table 7). For example, those disabled adults who have less than a high school education are more likely to smoke than those who have college degrees. Similarly, those disabled adults whose household incomes are less than $25,000 are more likely to smoke than the disabled whose household incomes are $75,000 or more.

[14] For this report, the term disability applies to individuals if, for at least one year, (1) they had an impairment that limited activities or caused cognitive difficulties, (2) they used special equipment or required help from others to get around, or (3) they reported a disability of any kind.

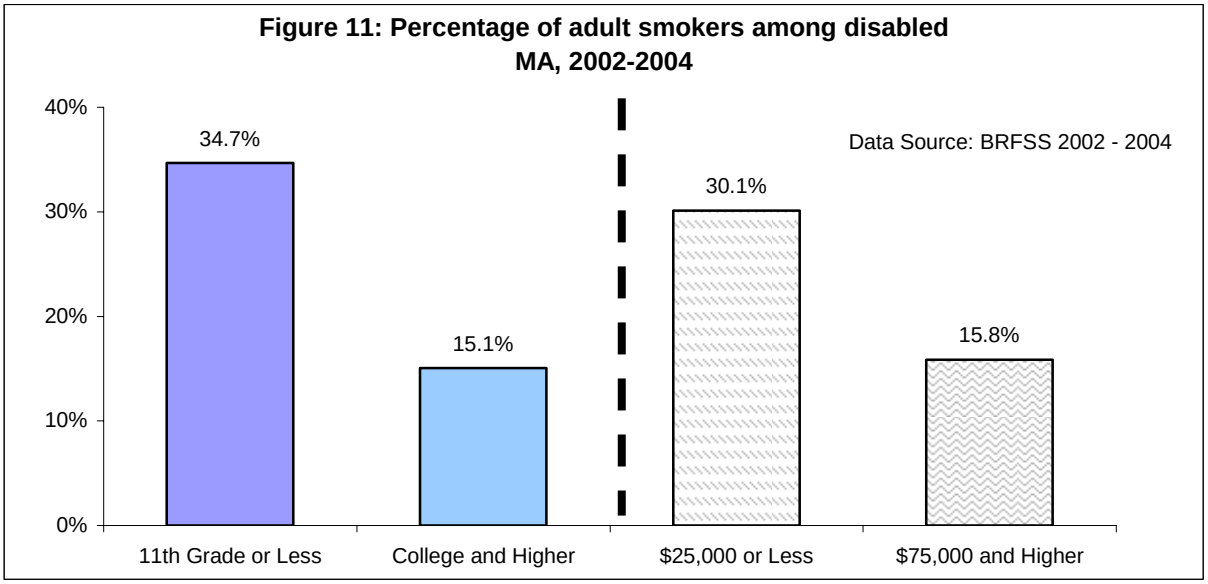


Figure 11: Percentage of adult smokers among disabled
MA, 2002-2004
40%
30%
20%
10%
0%
34.7%
15.1%
30.1%
15.8%
Data Source: BRFSS 2002 - 2004
11th Grade or Less
College and Higher
$25,000 or Less
$75,000 and Higher

4. Comparison by Municipality

Question: Are smoking rates the same across the Commonwealth?

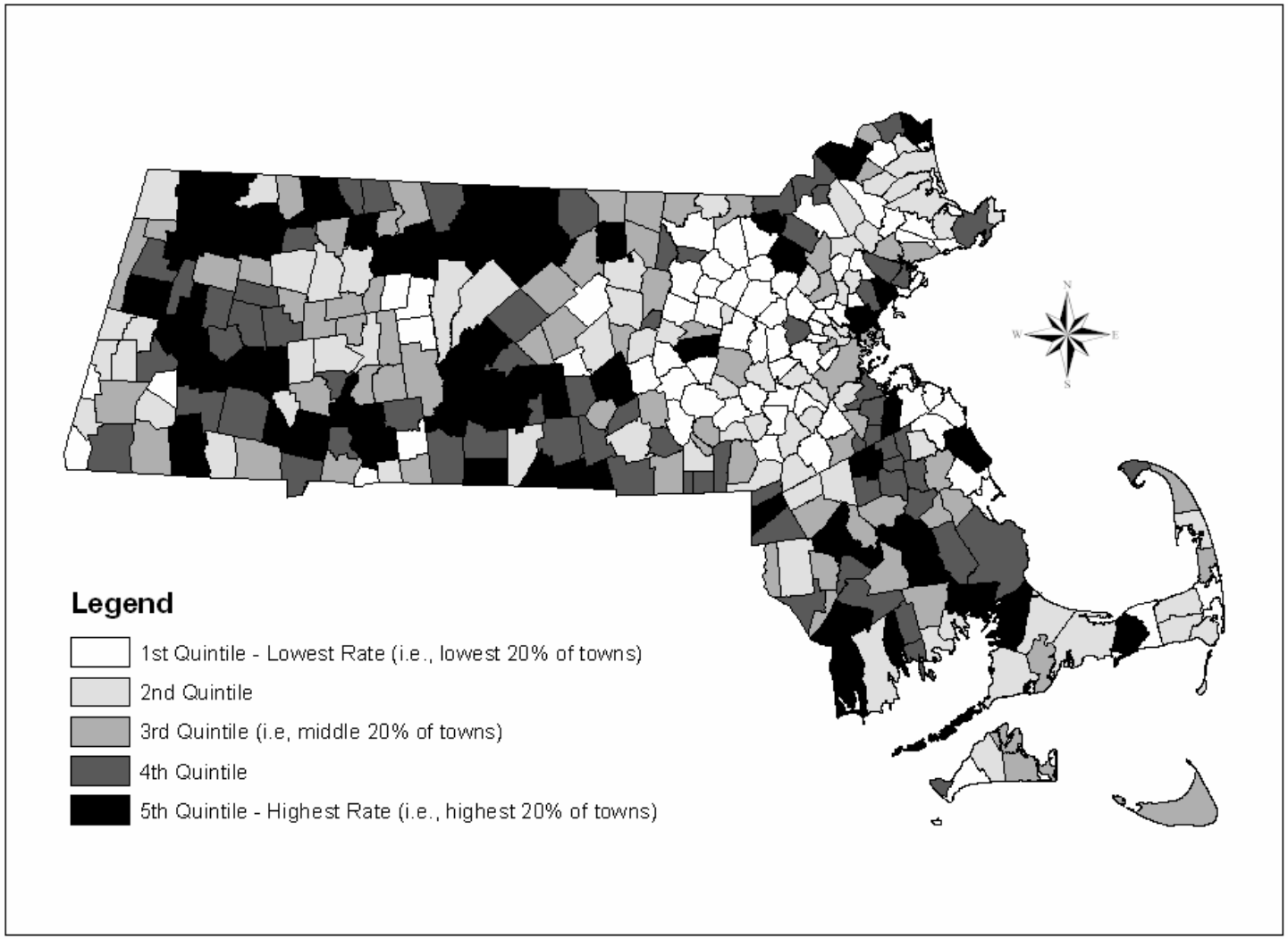
Geography is another important factor to consider when examining the smoking rates in Massachusetts. If the rates are roughly the same for every region across the Commonwealth, then the public health response should be similar from region to region. If, however, the rates are significantly different across communities, resources may need to be targeted to specific regions as well as to specific communities within these regions.

In 2006, the Tobacco Control Program of the Massachusetts Department of Public Health completed an analysis in which smoking prevalence estimates were obtained for all 351 communities in the Commonwealth. The first step in the analysis required combining five years of BRFFS survey responses (1999 – 2003). Next, the BRFSS survey responses were combined with other information such as lung cancer death rates and smoking rates during pregnancy. This expanded data set was used to make local area estimates. The map presented below shows these variations by community. To display the estimates of smoking prevalence, communities were grouped into quintiles. The 20% of communities with the lowest estimated rates of smoking were placed in the first quintile and the 20% of communities with the highest estimated rates of smoking were placed in the fifth quintile. One glance at this map demonstrates the fact that regional differences do exist.

As is seen from the map, smoking rates were lower in the Metrowest region around Boston. The Metrowest region has the highest income and highest percentage of college graduates.[15] At the other end of the spectrum, rates were higher in the western, central, and southeastern parts of Massachusetts. Annual household incomes and educational levels are lower in these regions when compared to the rest of the Commonwealth.[16]

[15] U.S. Census Bureau; Census 2000, Summary File 1; generated by Thomas Land; using American FactFinder; <http://factfinder.census.gov>; (1 August 2006).
[16] Ibid.

Estimated Smoking Prevalence by Town 1999 - 2003



Department of Public Health
Massachusetts Tobacco Control Program

Geographic data supplied by:
Massachusetts Executive Office of Environmental Affairs, MassGIS.

Version 1.0 January 13, 2006

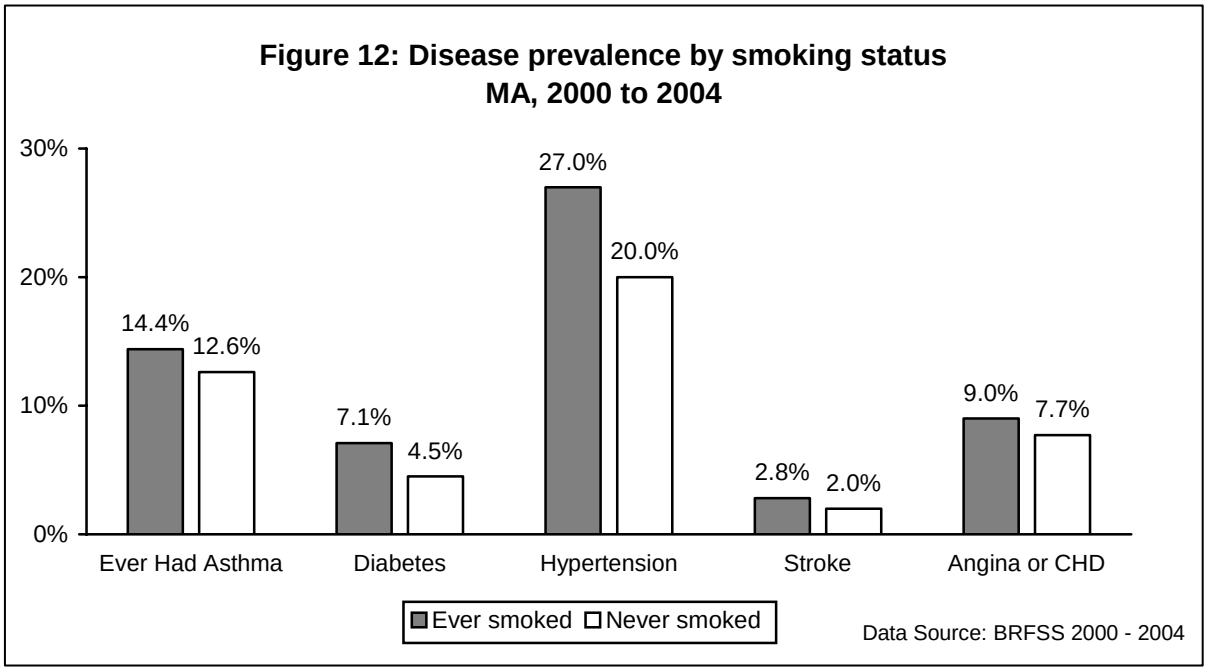
PART II: SMOKING, DISEASE, AND OTHER RISK FACTORS

1. Disease prevalence by smoking status

Question: How is smoking related to disease?

In 1964, the Surgeon General of the United States linked cigarette smoking to significant health risks such as lung cancer. Since that time, the list of diseases related to smoking has lengthened considerably. Moreover, quitting smoking has been shown to have beneficial health effects for a wide variety of diseases.[17] For these reasons, BRFSS data were examined to determine the relationship between smoking and health problems such as diabetes, asthma, hypertension, heart disease, and stroke.

A time lag may exist between smoking and the development of disease. Doctors may warn patients of the potential health consequences of smoking many years before any problems arise. Furthermore, some patients will quit in response to a doctor's advice. In order to more accurately account for the long term impact of smoking on health, the categories of current and former smokers were combined. Based on aggregate data from 2000 – 2004, adults who have ever smoked were more likely to report that they had asthma, diabetes, and hypertension than those who had never smoked. There were no differences in reported rates for stroke, angina, and coronary heart disease (Figure 12 and Table 8).



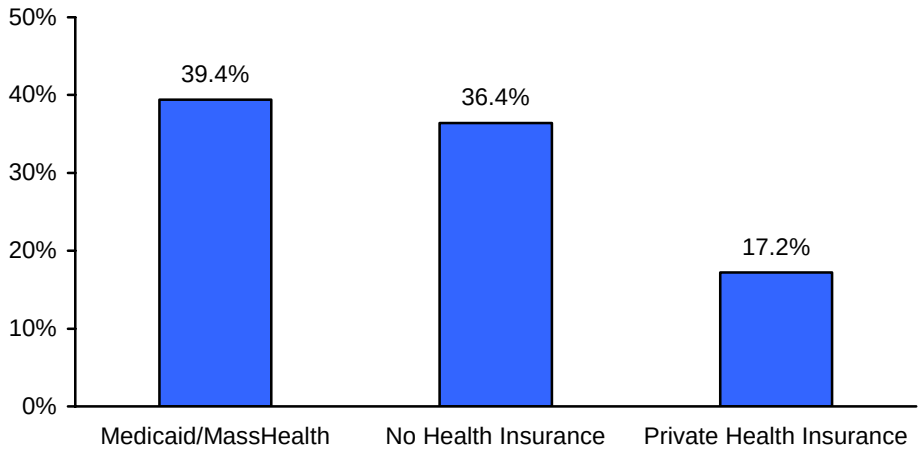
[17] U.S. Department of Health and Human Services. *The health consequences of smoking: a report of the Surgeon General.* Atlanta, GA: U.S. Dept. of Health and Human Services, Centers for Disease Control and Prevention, Office on Smoking and Health, 2004. Accessed 9/5/2006 on website at http://www.cdc.gov/tobacco/sgr/sgr_2004/index.htm.

2. Health insurance access by smoking status

Question: Are there differences in health insurance coverage between smokers and non-smokers?

Figure 13 displays the smoking rates by health insurance status for adults ages 18 – 64. Adults who are privately insured smoke at a much lower rate than adults who have no insurance. They also smoke at a lower rate than those who are covered by Medicaid or MassHealth. Only 17.2% of individuals with private insurance are smokers. Among MassHealth members, the smoking rate is 39.4%. The rate is 36.4% for individuals with no health insurance. The difference between the Medicaid/MassHealth group and the No Health Insurance group is not statistically significant (Figure 13 and Table 9).

Figure 13: Smoking Prevalence by health insurance status MA, 2001 to 2005



Data Source: BRFSS 2001 - 2005

3. Smoking and other health risk factors

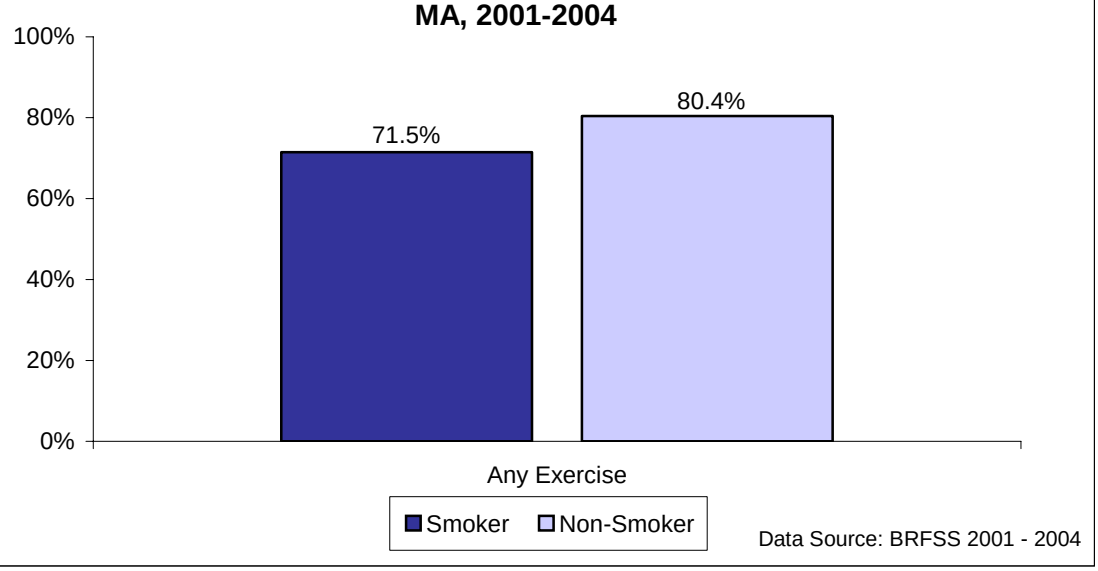
Question: Do smokers engage in other risky behaviors?

The BRFSS includes questions about smoking, drinking, exercising, and a variety of other health-related topics. A cross-tabulation of the smoking questions demonstrates that smoking is related to a wide array of behavioral health risk factors.

a. Exercise

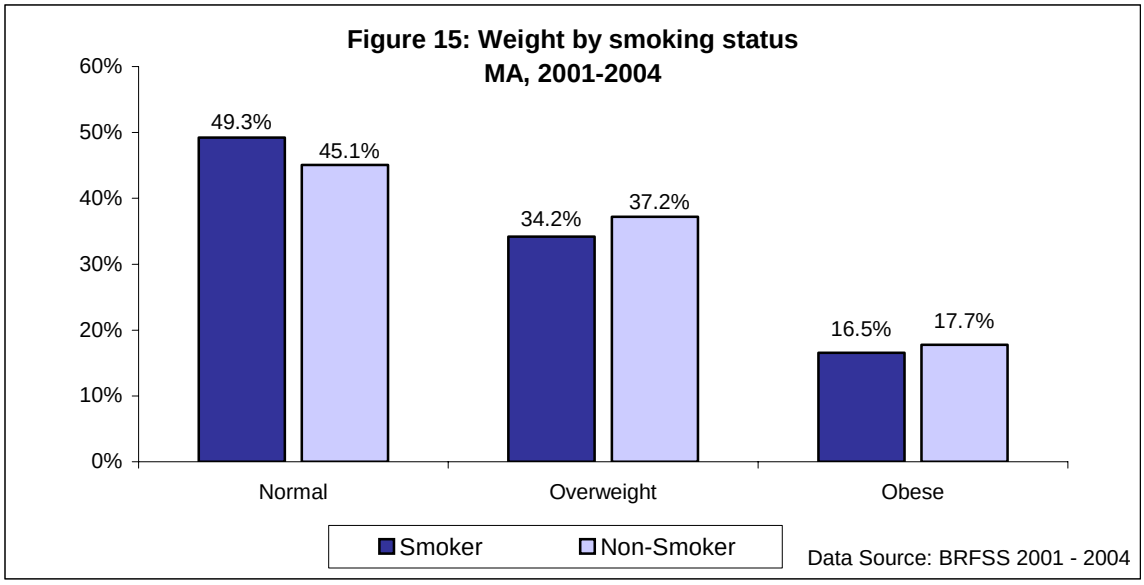
Adult non-smokers were more likely to report that they engaged in any physical activity than adult smokers (Figure 14 and Table 10). Among non-smokers, 80% reported that they engaged in any exercise compared to 72% among adult smokers.

Figure 14: Physical activity by smoking status, MA, 2001-2004



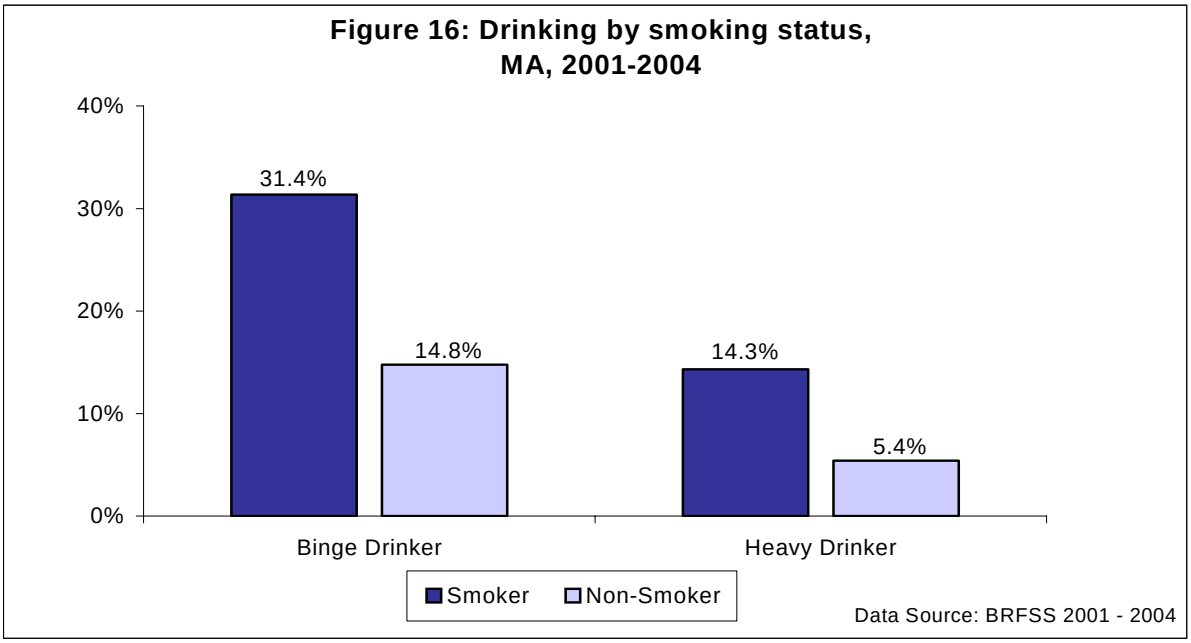
b. Weight

There was no difference between smokers and non-smokers in the percentage of adults who were obese (Figure 15 and Table 10). Among smokers, 49% were normal weight while only 45% were normal weight among non-smokers. For non-smokers, 37% were overweight compared to 34% of adult smokers.



c. Drinking

Adult smokers were more likely than non-smokers to be binge drinkers and heavy drinkers (Figure 16 and Table 10). Among adult smokers, 31% reported binge drinking compared to only 15% of non-smokers. Similarly, 14% reported heavy drinking compared to only 5% of non-smokers.

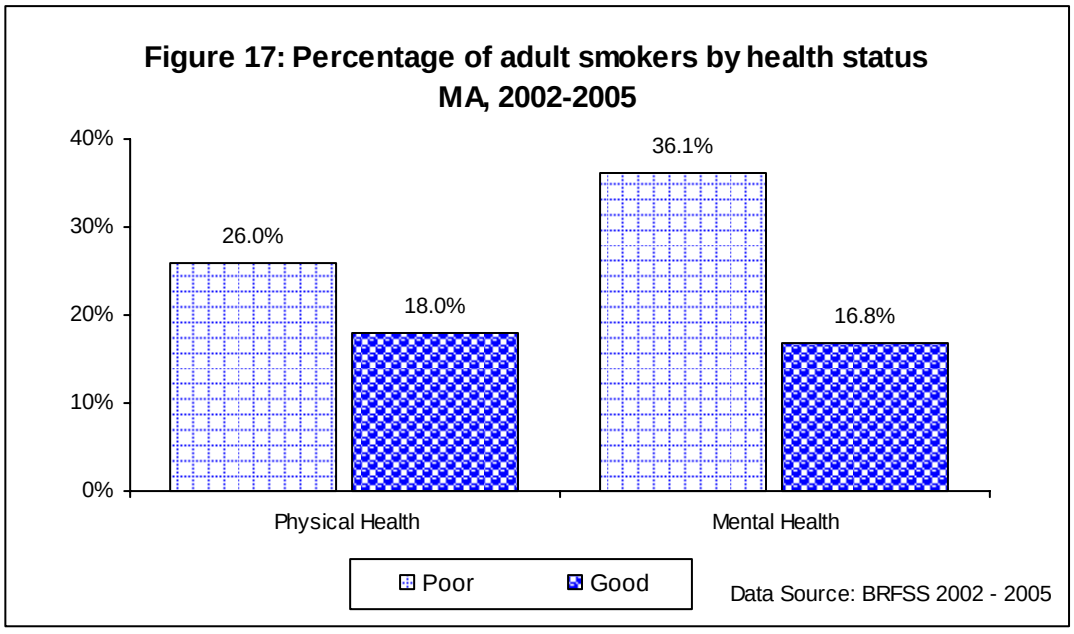


4. Relation of smoking to perceived health status

Question: Is smoking related to general health problems and mental health problems?

The BRFSS includes questions about an individual's perception of his or her health. Respondents are asked whether their general health is excellent, good, fair, or poor. Respondents are also asked about their physical and mental health.

Despite the strong correlation between smoking and chronic health conditions, adults who say that they are in poor health still smoke at a significantly higher rate than those who report that they are in good health (Figure 17 and Table 11). This difference holds for both physical health and mental health. It is particularly strong for adults who report poor mental health.

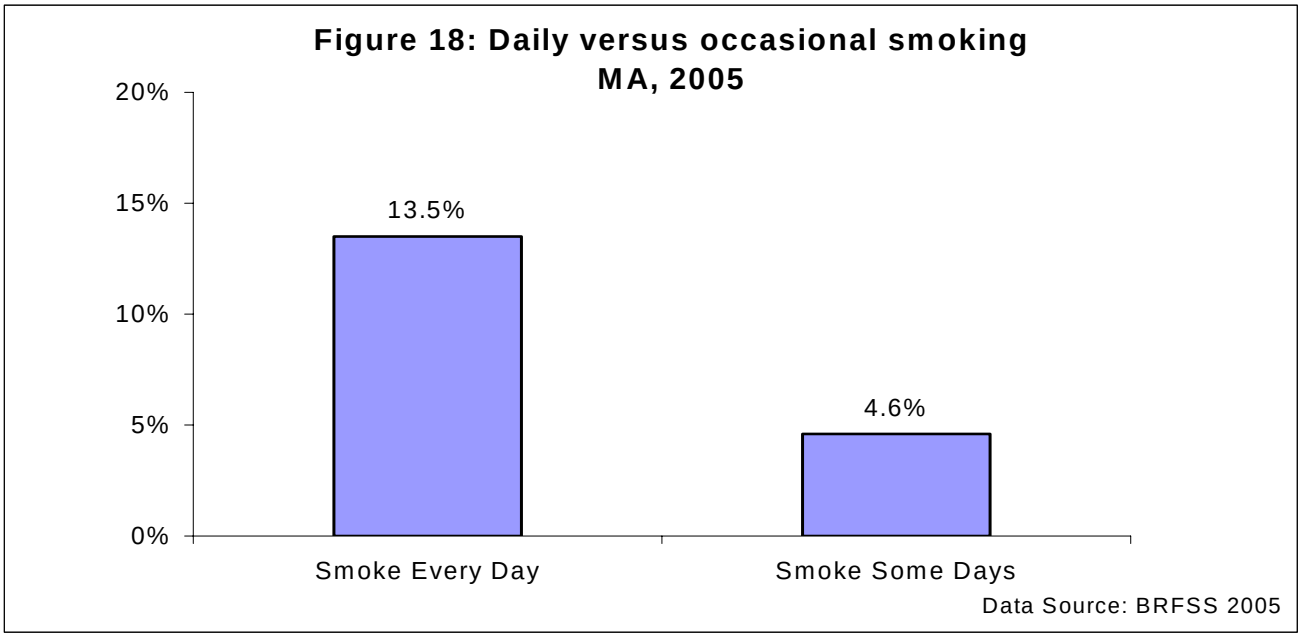


PART III: SMOKING BEHAVIOR

1. Daily versus occasional smokers

Question: Do all smokers smoke every day?

No. Since smoking is an addiction, it is not surprising that approximately three of four smokers report that they smoke every day. Others smoke on some but not all days. Some are light smokers, while others smoke more than a pack a day (Figure 18).

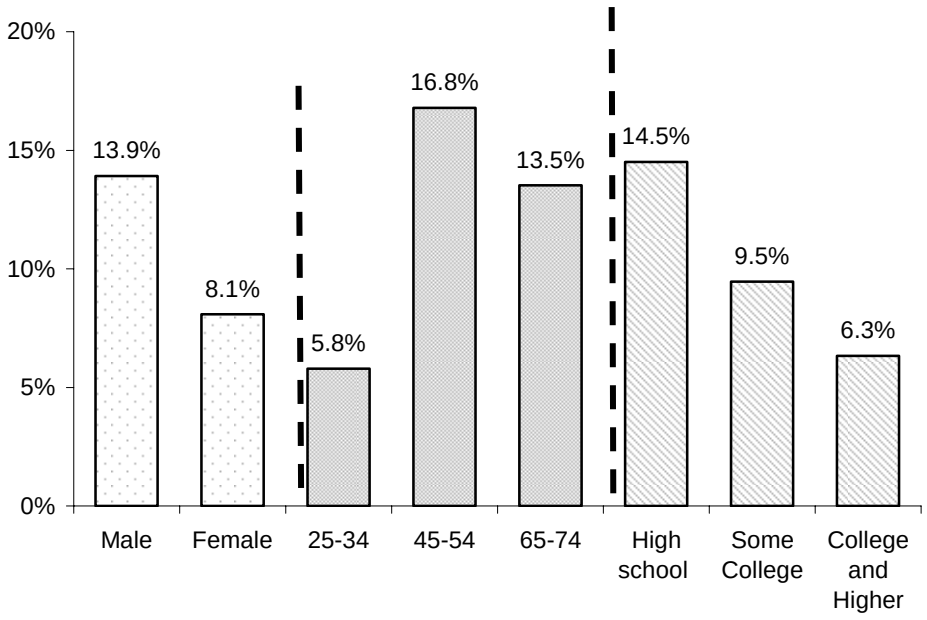


Similarly, not all daily smokers are heavy smokers. In fact, only one in eight daily smokers report smoking more than a pack a day[18] – a common definition of heavy smoking. Half of daily smokers smoke between 11 and 20 cigarettes per day. The remaining 38% smoke 10 or fewer cigarettes per day.

Some socio-demographic characteristics of heavy smokers (those who smoke more than 20 cigarettes per day) are presented below (Figure 19). Heavy smokers were more likely to be men, somewhat older than other smokers, and less educated. While only 6% of young adults ages 25-34 were heavy smokers, almost three times as many (17%) middle-aged adults ages 45-54 were heavy smokers. Educational differences among heavy smokers matched the pattern in the overall population of smokers. Those with a college degree were less likely to be heavy smokers than those with less than a college degree (Figure 19 and Table 12).

[18] Typically, a single pack contains 20 cigarettes.

Figure 19: Percentage of heavy smokers among smoking population, MA, 2002-2004



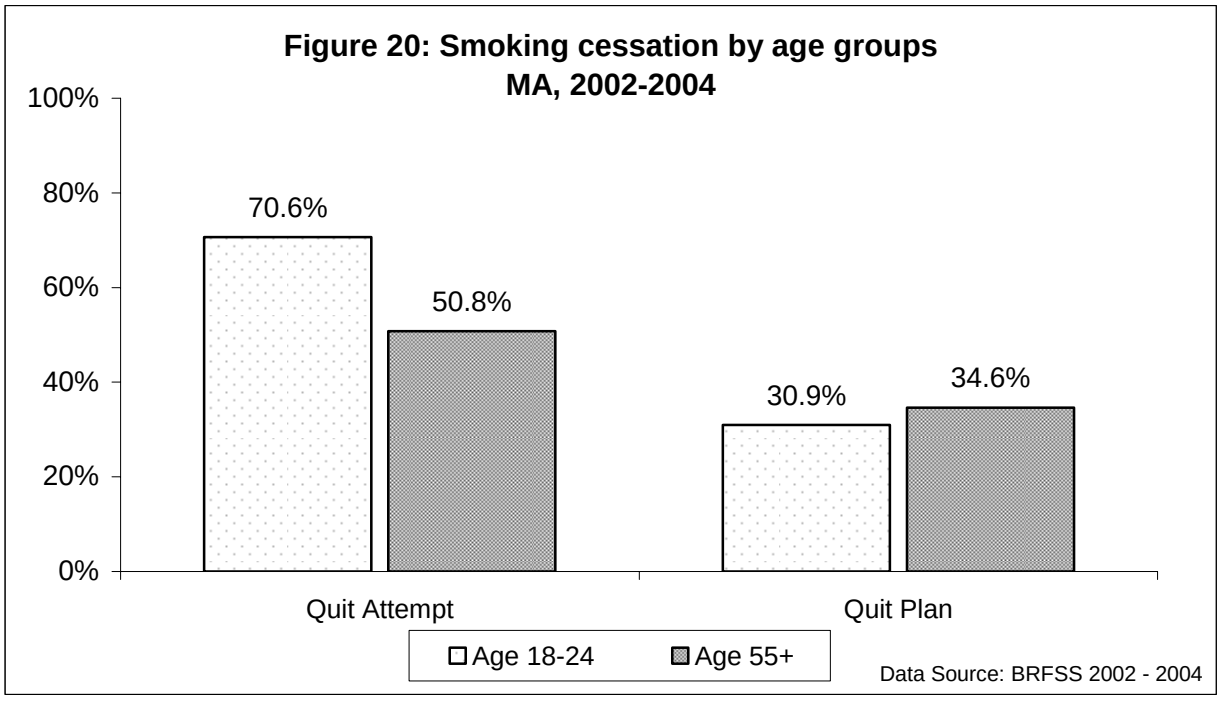
Data Source: BRFSS 2002 - 2004

2. Quit plans and quit attempts

Question: What percentage of smokers try to quit smoking or plan to quit in the future?

Nearly three in five current smokers report having tried to quit in the previous 12 months, but fewer than one out of ten former smokers report having quit in the past year. Quitting smoking is difficult and most make several attempts before succeeding. Adults 18-24 years old are more likely to make a quit attempt than adults 55 years old and over (Figure 20. More detailed information about smoking cessation by age groups is presented in Table 13).

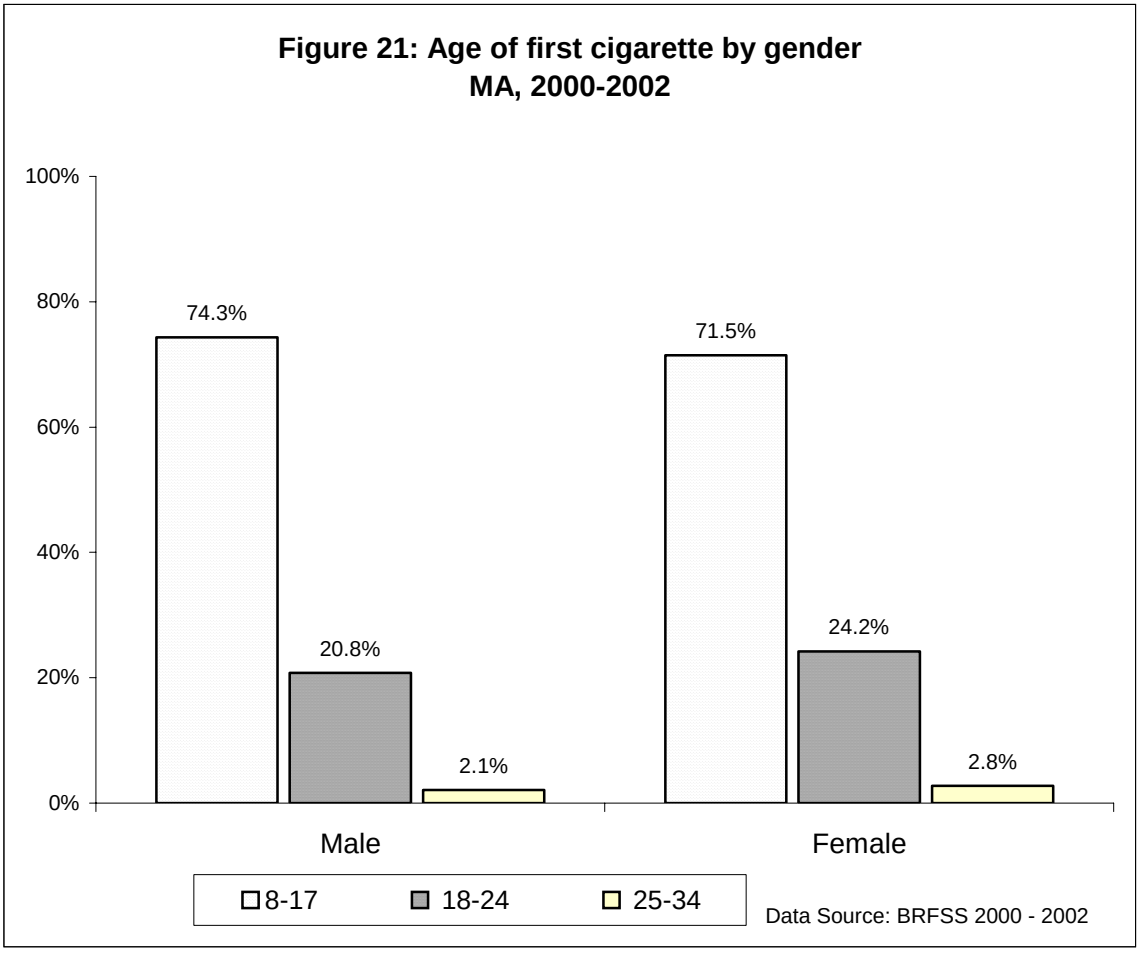
Approximately one-third of smokers in Massachusetts between 2002-2004 reported that they planned to make a quit attempt within the next 30 days, but younger smokers were more likely to actually have made an attempt to quit at some time during the previous 12 months.



3. Age of first cigarette and age of regular smoking

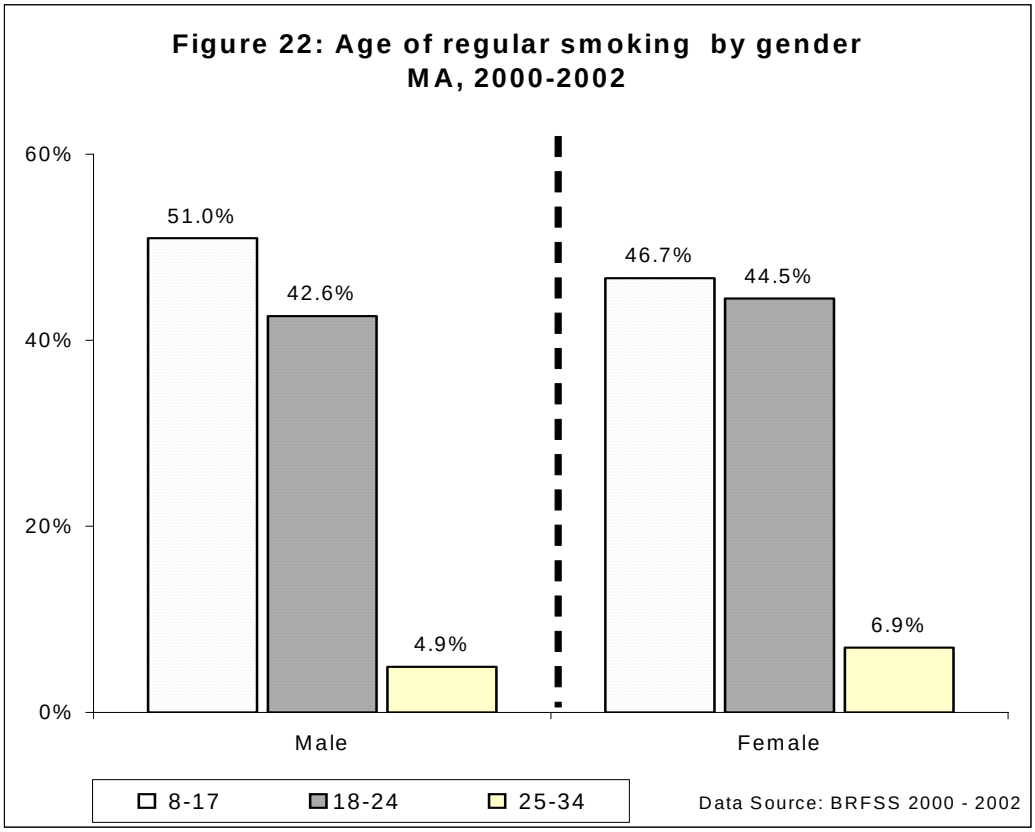
Question: When do smokers start smoking?

Most smokers try smoking for the first time at a very young age (Figure 21). Over 70% of men and women reported smoking their first cigarettes before they were eighteen years old and fewer than 3% first tried smoking at 25 years old and over (Table 14). Since relatively few adult smokers began smoking as adults, efforts to delay the onset of smoking may gradually lower the rate of adult smoking in the Commonwealth.



Given the addictive nature of smoking, it is not surprising that regular smoking also begins at an early age. Over half of males and nearly half of females reported regular smoking before the age of 18 (Figure 22 and Table 15). In contrast, a much smaller percentage of smokers began to smoke regularly at 25 years or older, 5% and 7% for males and females, respectively.

Recent studies have shown that brains of children react more strongly to the nicotine in cigarettes and thus are more susceptible to nicotine addiction.[19] Here again, efforts to delay the onset of smoking may pay dividends in the future by gradually lowering the rate of adult smoking in the Commonwealth.



[19] Nora Volkow, M.D., presentation at the 13th Annual World Conference on Tobacco, July 2006.

PART IV: SECONDHAND SMOKE

1. Trends in exposure to secondhand smoke

Question: Has exposure to secondhand smoke changed over time?

Secondhand smoke, also known as environmental tobacco smoke (ETS), is the combination of smoke exhaled by a smoker and the smoke from a burning cigarette, cigar, or pipe. Secondhand tobacco smoke contains more than 250 chemicals known to be toxic or carcinogenic (cancer-causing) including formaldehyde, benzene, vinyl chloride, arsenic, ammonia, and hydrogen cyanide.[20] Non-smokers exposed to secondhand smoke at home or work increase their risk of developing heart disease by 25 to 30 percent and lung cancer by 20 to 30 percent.[21] The 2006 Surgeon General report concluded that there is no risk-free level of exposure to secondhand smoke.[22]

To protect Massachusetts residents from the harmful effects of secondhand tobacco smoke, Massachusetts passed the Smoke-Free Workplace Law, effective July 5, 2004. The statewide law prohibits smoking in workplaces, including private offices, taxis, restaurants and bars. This law was the culmination of efforts begun in many cities and towns across the Commonwealth in the 1990s and early 2000s, when many communities passed some form of smoke-free ordinance.

Since 2002, respondents to the BRFSS have been asked to report the number of hours of exposure to secondhand smoke in the 7 days prior to answering the survey. Responses are recorded for exposure inside the home, inside the workplace, and in all other places outside the home and workplace. These categories were combined to yield an "overall" level of exposure to secondhand smoke.

The most sensitive measure of secondhand smoke exposure is one that records any length of exposure. Since 2002, the percentage of respondents reporting any exposure to secondhand smoke has decreased significantly (Figure 23 and Table 16). In the first half of 2002, 62% of respondents reported any exposure in the previous 7 days. That figure dropped to 46% in the last half of 2005.

[20] U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. Atlanta, GA: Centers for Disease Control and Prevention, Office on Smoking and Health, 2006.
[21] Ibid.
[22] Ibid.

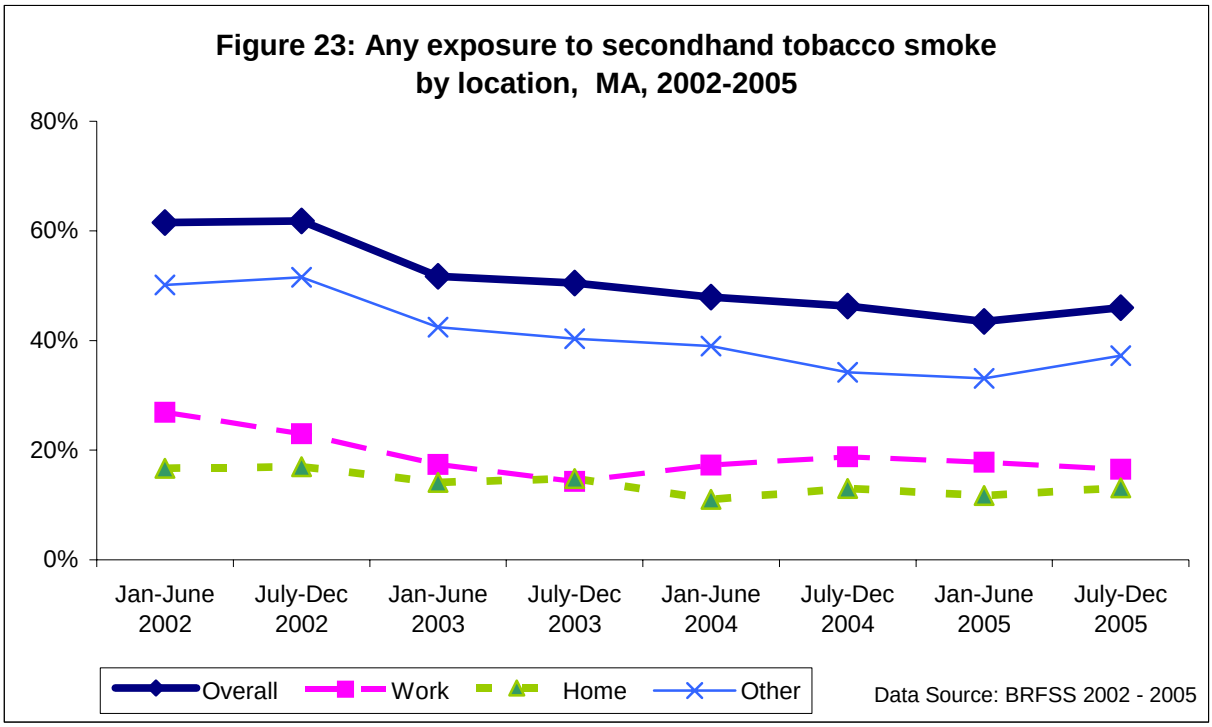
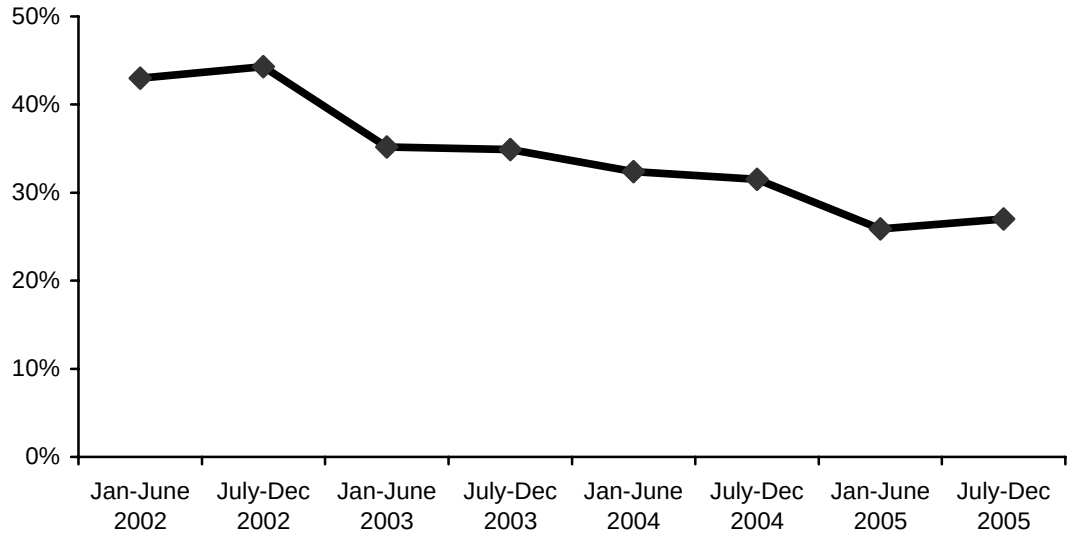


Figure 23: Any exposure to secondhand tobacco smoke by location, MA, 2002-2005
80%
60%
40%
20%
0%
Jan-June 2002
July-Dec 2002
Jan-June 2003
July-Dec 2003
Jan-June 2004
July-Dec 2004
Jan-June 2005
July-Dec 2005
Overall
Work
Home
Other
Data Source: BRFSS 2002 - 2005

Prolonged exposure to secondhand smoke carries with it greater risks to an individual's health. For the purposes of this report, prolonged exposure will be defined as more than one hour of exposure in the previous 7 days. As with the rate for *any exposure* to secondhand smoke, the rates for prolonged exposure are also dropping. In 2002, 43% of Massachusetts residents reported more than one hour of exposure to secondhand smoke in the previous 7 days. That figure dropped to 27% in 2005 (Figure 24 and Table 17).

Figure 24: Exposure to secondhand tobacco smoke (>1 hour/week), MA, 2002-2005



Data Source: BRFSS 2002 - 2005

2. Socio-demographic comparisons of ETS exposure

Question: Does exposure to secondhand smoke vary by different social and demographic groups?

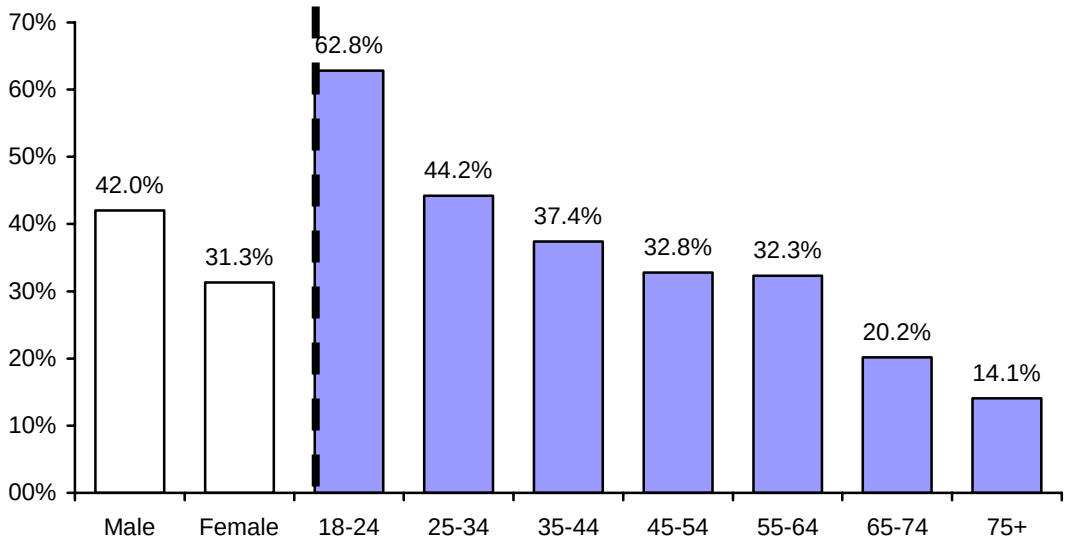
Yes. Exposure to secondhand smoke differs by gender, by age group, by educational level, and by race/ethnicity. For prolonged exposure, group differences are a function of where the exposure took place – whether at home, at work, or elsewhere.

a. Gender and Age

Males are significantly more likely than females to report exposure to secondhand smoke (Figure 25 and Table 18). The rate for males is 42% compared to 31% for females.

There is also a strong relationship between age and exposure to secondhand smoke (Figure 25 and Table 18). Young adults age 18 to 24 reported the highest rate of exposure to secondhand smoke of any age group; more than three in five reported exposure and this is triple the rate found for adults over 65.

Figure 25: Exposure to secondhand tobacco smoke (>1 hour/week) by gender and age, MA, 2002-2004

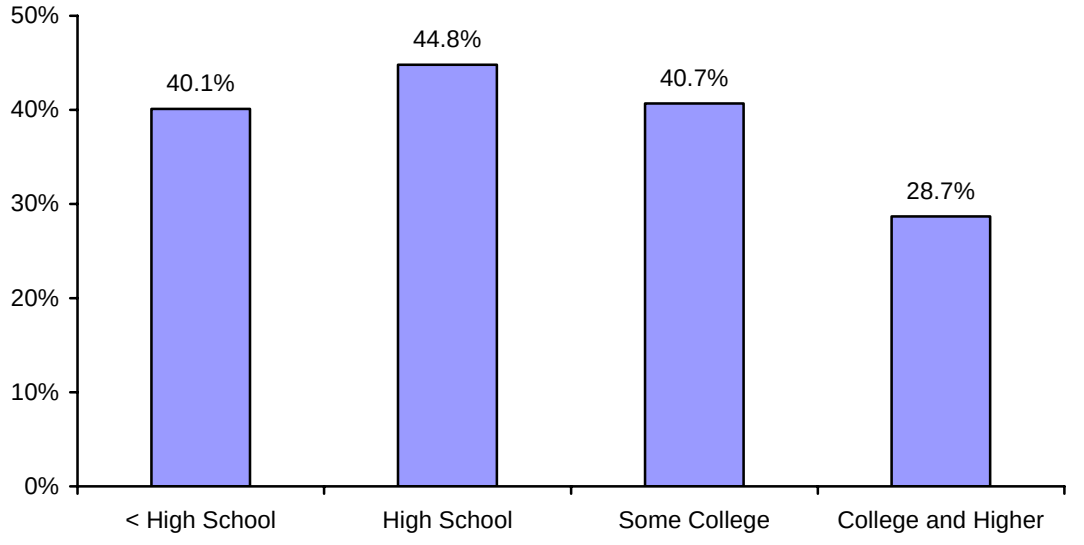


Data Source: BRFSS 2002 - 2004

b. Educational Level

Previously, it was shown that the smoking prevalence rate for college-educated adults was lower than for adults with less than a college education (Figure 6 and Table 5). Given that difference, it should not be surprising that college-educated adults are also significantly less likely to report prolonged exposure to secondhand smoke than do adults with less education. There is no difference in reported exposure rates between those with less than a high school education, a high school education, and one to three years of college education (Figure 26 and Table 18).

Figure 26: Exposure to secondhand tobacco smoke (>1 hour/week) by education level, MA, 2002-2004

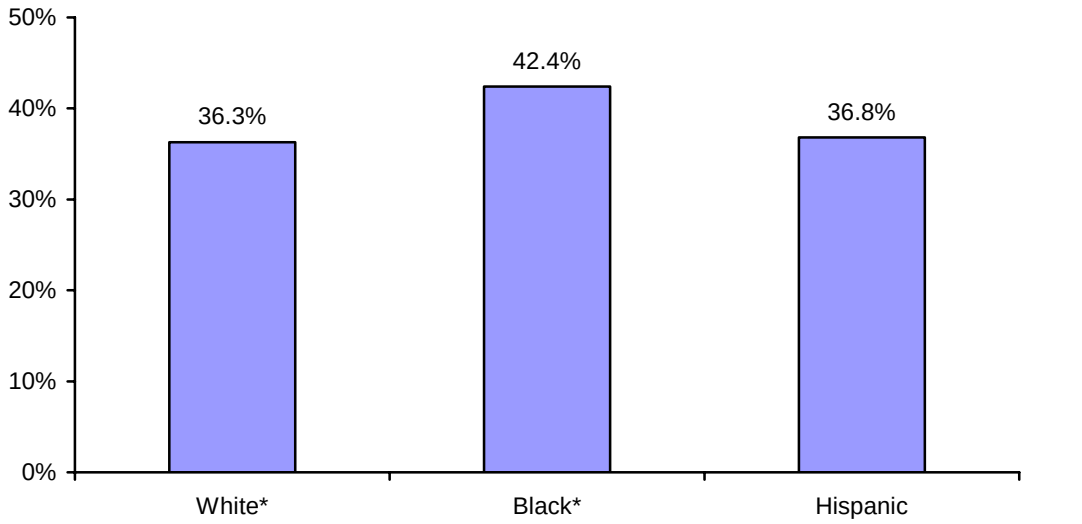


Data Source: BRFSS 2002 - 2004

c. Race/Ethnicity by Location

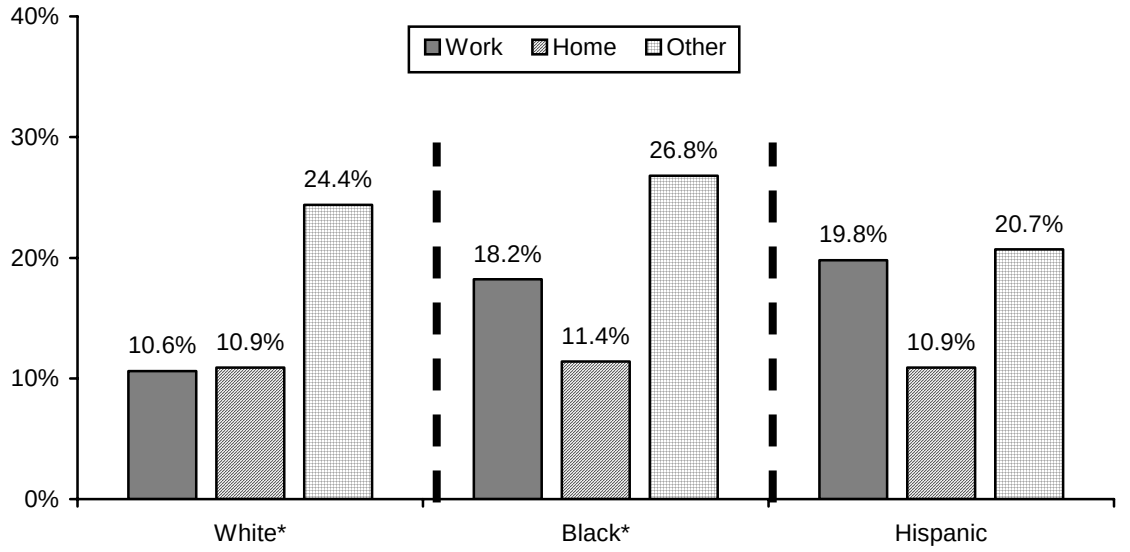
Although there are no differences in the smoking prevalence rates by race/ethnicity (Figure 9 and Table 5), Black (non-Hispanics) are significantly more likely to report prolonged exposure to secondhand smoke (Figure 27 and Table 18). There is no difference between White (non-Hispanics) and Hispanics in rates of reported exposure (>1 hour/week).

Figure 27: Exposure to secondhand tobacco smoke (>1 hour/week) by race/ethnicity, MA, 2002-2004



The higher rate of prolonged exposure to secondhand smoke among Black (non-Hispanics) is primarily due to more exposure in the workplace (Figure 28 and Table 19). Specifically, a higher percentage of Black (non-Hispanics) report prolonged exposure in the workplace than do White (non-Hispanics). Hispanics also report more prolonged exposure to secondhand smoke in the workplace than White (non-Hispanics).

Figure 28: Exposure to secondhand tobacco smoke (>1 hour/week) by race/ethnicity and location, MA, 2002-2004



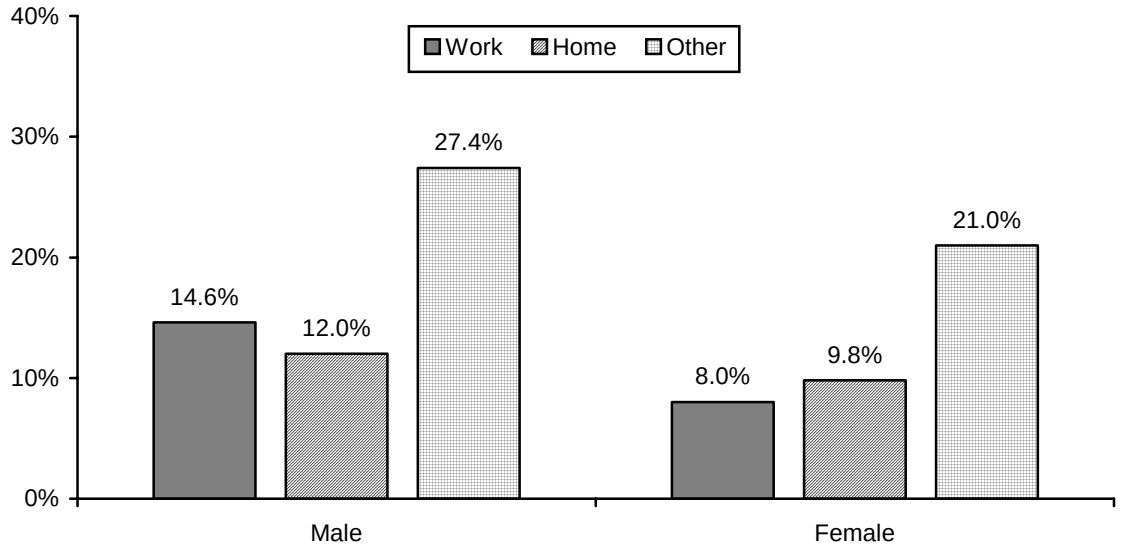
* Non-Hispanic

Data Source: BRFSS 2002 - 2004

d. Gender by Location

As shown above, males are more likely to report any amount of exposure to secondhand smoke (Figure 25 and Table 18). These gender differences also hold for prolonged exposure in the workplace and elsewhere. In the workplace, males are more likely than females to report prolonged exposure (Figure 29 and Table 19). Males are also more likely to be exposed to secondhand smoke in places other than the home and workplace.

Figure 29: Exposure to secondhand tobacco smoke (>1 hour/week) by gender and location, MA, 2002-2004



* Non-Hispanic

Data Source: BRFSS 2002 - 2004

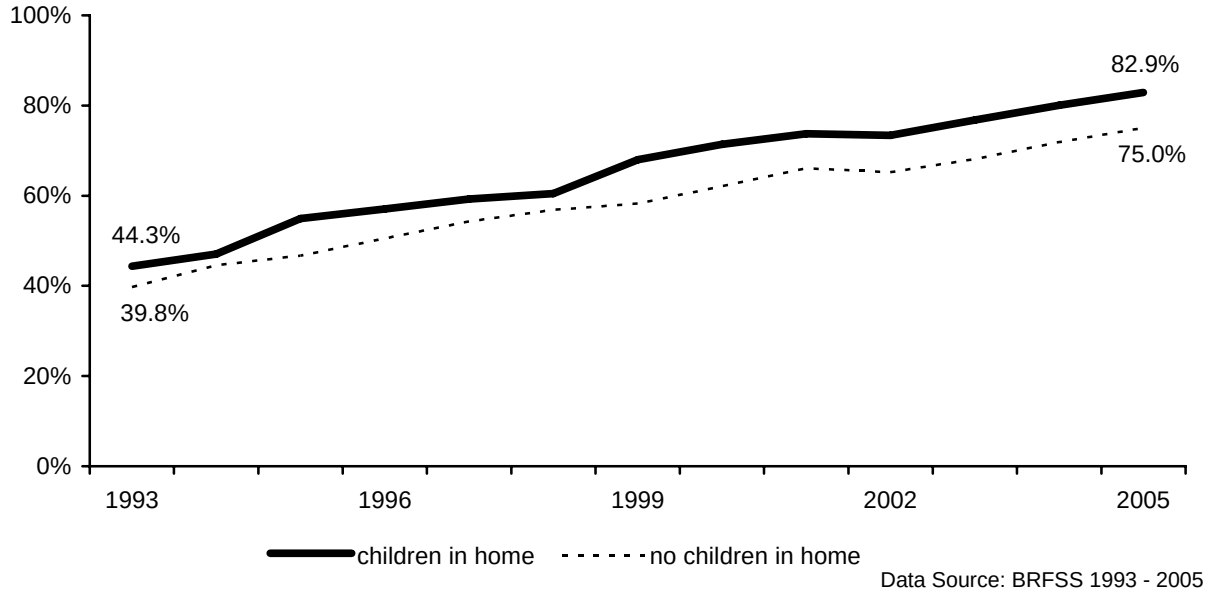
3. "No Smoking in the Home" Rules

Question: Do more people voluntarily prohibit smoking in their home?

a. Trends over time

Yes. In fact, there have been dramatic changes in the percentage of adults who have a voluntary no smoking rule in their own home. The change is found for households with children as well as for households with no children. Since 1993, the percentage of adults with "no smoking in the home" rules has nearly doubled (Figure 30 and Table 20). Seeing such a large increase in a relatively short time span (12 years) seems to be evidence of a change in social norms. It is now unusual for an adult to permit smoking in the home. Nonetheless, nearly one-quarter million Massachusetts children still live in homes where they may be exposed to secondhand smoke.

Figure 30: Percentage of households with "no smoking" rule at home, MA, 1993-2005



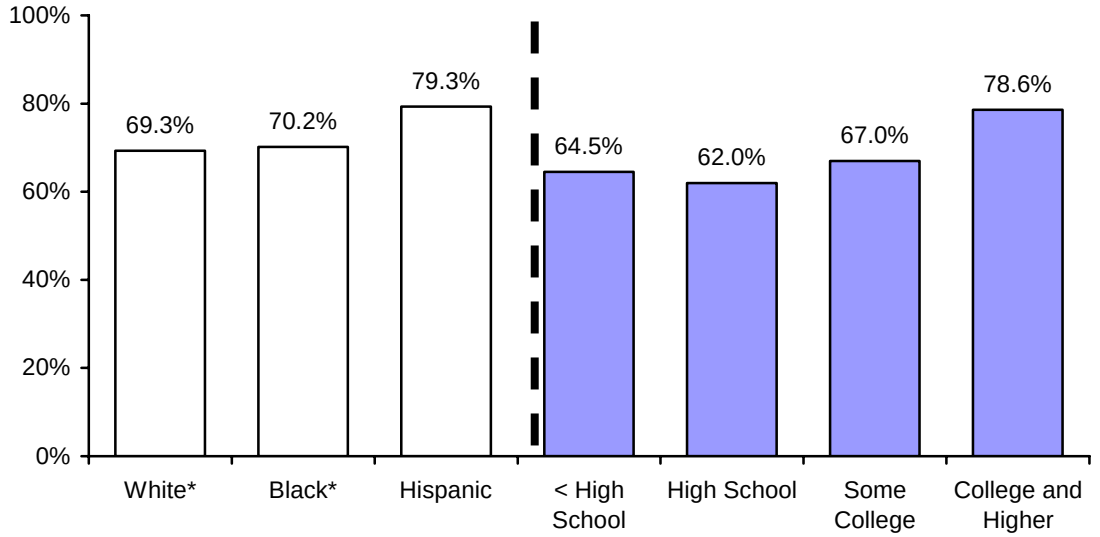
Data Source: BRFSS 1993 - 2005

b. Socio-demographic comparisons

"No smoking in the home" rules are common among all race/ethnicity groups. Four out of five Hispanic and Asian (non-Hispanic) adults have a rule that smoking is not allowed in the home. Although the rates for White (non-Hispanic) and Black (non-Hispanic) adults are lower than for Hispanics and Asians, well more than half of all adults in all groups have a no-smoking rule for their homes (Figure 31 and Table 21).

As with measures of smoking prevalence and exposure to secondhand smoke, there is a relationship between educational level and voluntary "no smoking in the home" rules. Adults with four years of college or more are more likely to have a rule that smoking is not allowed in the home than those with less education (Figure 31 and Table 21). In comparing the no-smoking rules at home for adults with a high school education, less than high school education, and 1 – 3 years of college, no statistically significant differences were found.

Figure 31: No-smoking rule at home by demographic group MA, 2001-2004

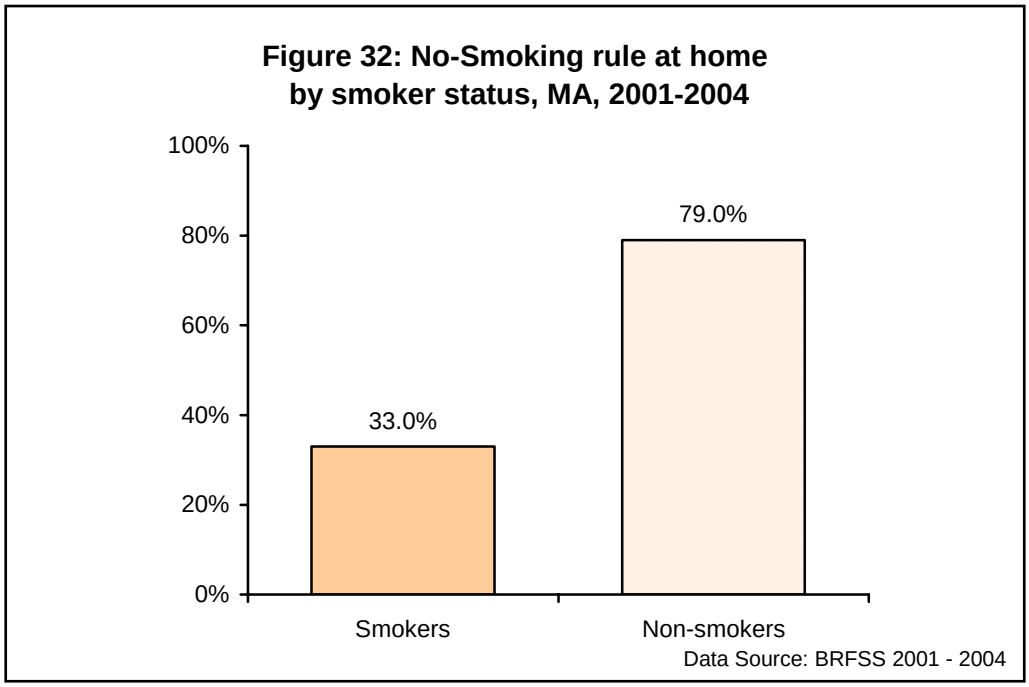


Data Source: BRFSS 2001 - 2004

c. Comparison by smoking status

Since smoking is an addictive habit, it is not surprising that there is a large difference between smokers and non-smokers with respect to having a "no smoking in the home" rule. Less than half as many smokers as non-smokers have a rule about not smoking in the home (Figure 32 and Table 21).

In an effort to encourage smokers to establish a no-smoking rule at home, the Environmental Protection Agency has developed a smoke-free home pledge program which educates families about the dangers of secondhand smoke and provides guidance on how to maintain a smoke-free home, particularly when children live in the home.



PART V: BRIEF SUMMARY

Because tobacco use is a chronic relapsing disease with long-term health effects, it is hoped that this report has shed light of the nature of the problem as well as changes in use, attitudes, and impact in Massachusetts over the past two decades.

It should not be forgotten that tobacco use is the leading cause of preventable death in the Commonwealth. In the past 20 years, progress has been made: fewer people smoke; fewer are exposed to secondhand smoke; and more people have no smoking rules in their homes. Despite these successes, this report should also be read with an eye toward addressing those areas which require more work.

APPENDIX

ABOUT THIS REPORT

This report summarizes selected tobacco use, exposure, and health implications data collected by the Massachusetts BRFSS from the 1986 through 2005. Definitions of important statistical concepts used in this report are provided in the Appendix. Definitions of other terms used in this report can be found in the Glossary at the end of the report. Tables with additional data are provided in this Appendix.

All the percentages in the report are weighted to reflect both the probability that an individual was selected to participate in the survey due to telephone number, the number of adults in a household, and the number of telephones in a household. Adjustments also are made to account for non-response and non-coverage of households without telephones. Differential participation by sex, age, and race-ethnicity are taken into account as well. All weighting factors are multiplied together to obtain the final weight for each respondent so that the weighted BRFSS data more closely approximate the Massachusetts adult population. There may be slight differences in estimates found in this report versus those in previous publications due to different sample weighting methods.

Readers should be aware that all data collected by the BRFSS are based on self-reported information from the respondents. Self-reported data may be subject to error for several reasons: an individual may have difficulty remembering events that occurred a long time ago or the frequency of certain behaviors; some respondents may over-report socially desirable behaviors or under-report behaviors they perceive to be less acceptable; and respondents may also report certain risks, behaviors and perceptions differently due to their respective cultural and linguistic backgrounds. Additionally, because the BRFSS surveys a randomly selected sample of Massachusetts adults, these results may differ from another random sample to some extent simply due to chance.

TERMS, DEFINITIONS, AND STATISTICAL METHODOLOGY USED IN THIS REPORT

The BRFSS data presented in this report describe socio-demographic characteristics, health behavior risk factors, co-morbidity, health care access and other characteristics of the adult population of Massachusetts as they relate to smoking status. In many cases, current smokers are compared with non-smokers. However, for reasons which will be explained below, health outcome analyses contrast non-smokers with current and former smokers. Topics covered in this report differ as to when corresponding questions were introduced into the Massachusetts BRFSS and whether comparable national data are available. Therefore, long-term time trends and comparisons with national data are presented when available. Multi-year composite figures were computed to increase the stability of estimates and add power (which is adversely affected by small sample sizes) to statistical comparisons. However, the number of years of data from which composite statistics were calculated varies due to variations in data availability. For example, the age at which respondents tried their first cigarette is available only for the years 2000 to 2002, whereas the percentage of smokers in Massachusetts is available for all 20 of the years in which Massachusetts has administered the BRFSS. Often the graphs and figures in the body of the report illustrate patterns by highlighting only selected population subgroups. The tables in the appendix contain more detailed information about the data presented graphically, including all socio-demographic population subgroups and 95% confidence intervals for the estimated proportions.

The **percentage (or rate)** is the weighted proportion of respondents in a particular category. The percentage of respondents used in this report reflects the burden of tobacco smoking or related health issues in a specific subgroup of the population (e.g. year of observation, age group, gender, etc).

In this report, a **95% confidence interval** (95% CI) is a range of estimates determined by the size of the sample, the degree of variability of the data, and the degree of risk we accept in interpreting values or differences found in a particular sample as values or differences in the population. If we could systematically collect data from all possible samples of the same size from the population of interest to us (MA adults), only about 5% of the confidence intervals generated from this process would fail to include the true population value. Therefore, a 95% confidence interval is a range within which the true value for a population should lie, but it still is an estimate. The 95% confidence intervals used in this report are indicators of the reliability of those estimates. The width of the confidence interval also indicates the precision of estimation; the wider the interval the less precision in the estimate. Smaller population subgroups or smaller number of respondents yield less precise estimates.

The criterion of **statistical significance** (at 95% probability level) was the basis for use of the terms “higher”, “lower”, “about the same “, “increase” or “decrease” in this report. The difference between two proportions is statistically significant (with 95% probability) if the 95% confidence intervals surrounding these two proportions do not overlap. (The difference still may be statistically significant if the confidence intervals for two proportions are minimally overlapping.) Survey data also contain measurement error, sampling error and other biases not

accounted for by the above mentioned test. For this reason, caution should be exercised when using the terms "higher" or "lower" to compare proportions.

The **annual percentage change** (APC) is a measure used for the analysis of trends over time. This estimation assumes a linear change in the proportion of values over a certain time period. A positive APC corresponds to an increasing trend, while a negative APC corresponds to a decreasing trend. All APCs calculated in this report were statistically tested (95% probability level) against the null hypothesis – "the proportion value is neither increasing nor decreasing over time." Calculating the linear approximation for the trend may not be accurate for longer periods of time (over 5 years) because the trend may change its direction over time. More sophisticated trend analysis is needed to determine whether any directional changes have occurred.

Joint point regression analysis software[23] calculates the number and location (in time) of points where trends change direction (join points).The join point regression model describes the trend as a sequence of linear segments between corresponding Join points, so that each segment has an associated APC, which is tested for its statistical significance.[24,25]

Moving average is a form of average which has been adjusted to reduce random fluctuations in a time series. Moving average smoothing is a technique used to make long-term trends clearer. A simple moving average used for time trend graphical data presentation is formed by computing the average of proportions over a two year period as was employed in this report.

Geographical differences displayed in the report were created using ArcMap software Version 9.1 (written by ESRI). This geographic information system (GIS) uses a list of complex polygons to define town boundaries. These polygons were developed by MassGIS.

Race-ethnicity categories in this report include White, Black, Hispanic, and Asian. The categories referring to White, Black, and Asian include only non-Hispanic respondents. All respondents reporting Hispanic ethnicity are included in the Hispanic category.

[23] Joint point Regression Program: Version 3.0. National Cancer Institute, Bethesda, MD, September 2003.

[10] Kim HJ, Fay MP, Feuer EJ, and Midthune DN. Permutation Tests for Jointpoint Regression with Applications to Cancer Rates. *Statistics in Medicine* 2000;19:335-351.

[11] Lerman, PM. Fitting Segmented Regression Models by Grid Search. *Applied Statistics* 1980;29:77-84.

DATA TABLES

TABLE 1 – PERCENTAGE OF ADULTS WHO CURRENTLY SMOKE, BY YEAR, MA, 1986-2005		
	%	95% CI
1986	27.8	24.9 - 30.8
1987	27.6	25.0 - 30.2
1988	26.9	24.3 - 29.5
1989	23.7	21.0 - 26.3
1990	24.1	21.5 - 26.6
1991	22.9	20.5 - 25.3
1992	23.5	21.1 - 25.8
1993	21.1	18.9 - 23.2
1994	22.3	20.3 - 24.2
1995	22.7	20.7 - 24.7
1996	22.7	20.7 - 24.8
1997	20.6	18.6 - 22.5
1998	21.1	19.5 - 22.7
1999	20.2	18.9 - 21.5
2000	19.9	18.9 - 21.0
2001	19.5	18.5 - 20.5
2002	18.9	17.8 - 20.1
2003	19.1	17.9 - 20.2
2004	18.5	17.3 - 19.7
2005	18.1	16.9 - 19.2

TABLE 2 – PERCENTAGE OF ADULTS WHO CURRENTLY SMOKE, BY YEAR, MA & US, 1990-2005

	Massachusetts	United States
1990	24.1	23.0
1991	22.9	23.1
1992	23.5	22.2
1993	21.1	22.6
1994	22.3	22.7
1995	22.7	22.4
1996	22.7	23.4
1997	20.6	23.2
1998	21.1	22.9
1999	20.2	22.6
2000	19.9	23.2
2001	19.5	22.8
2002	18.9	23.0
2003	19.1	22.0
2004	18.5	20.8
2005	18.1	20.5

TABLE 3 – PERCENTAGE OF ADULTS WHO CURRENTLY SMOKE, BY YEAR AND GENDER, MA, 1986-2005

	MALE		FEMALE	
	%	95% CI	%	95% CI
1986	28.6	23.9 - 33.3	27.1	23.5 - 30.8
1987	27.3	23.3 - 31.3	27.9	24.4 - 31.3
1988	27.1	23.0 - 31.3	26.8	23.5 - 30.0
1989	22.0	18.0 - 26.0	25.1	21.4 - 28.7
1990	26.7	22.7 - 30.7	21.8	18.5 25.1
1991	22.7	19.1 - 26.3	23.1	19.9 - 26.2
1992	25.9	22.2 - 29.6	21.2	18.2 - 24.3
1993	20.7	17.5 - 24.0	21.4	18.5 - 24.2
1994	23.9	20.8 - 27.1	20.8	18.3 - 23.2
1995	24.1	21.0 - 27.2	21.5	18.9 - 24.1
1996	23.4	20.1 - 26.6	22.2	19.5 - 24.9
1997	21.0	17.9 - 24.0	20.2	17.8 - 22.6
1998	21.2	18.7 - 23.6	21.0	18.8 - 23.2
1999	20.6	18.4 - 22.7	19.9	18.3 - 21.5
2000	20.2	18.5 - 21.8	19.7	18.4 - 21.1
2001	20.4	18.8 - 22.0	18.7	17.4 - 20.0
2002	20.1	18.3 - 21.9	17.9	16.5 - 19.3
2003	20.0	18.1 - 21.8	18.3	16.9 - 19.7
2004	19.7	17.7 - 21.6	17.4	15.9 - 18.8
2005	18.2	16.3 - 20.1	17.9	16.4 - 19.3

TABLE 4 – PERCENTAGE OF ADULTS WHO CURRENTLY SMOKE, BY YEAR AND AGE GROUPS, MA, 1986-2005								
	18-24		25-34		35-44		45-54	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
1986	26.2	17.5 - 34.8	35.6	29.5 - 41.8	34.8	27.9 - 41.7	26.1	17.9 - 34.3
1987	32.4	24.7 - 40.1	30.0	24.8 - 35.1	27.9	22.4 - 33.4	31.1	23.0 - 39.3
1988	28.0	20.5 - 35.5	30.8	25.8 - 35.9	32.2	26.3 - 38.1	29.4	21.6 - 37.1
1989	27.0	18.9 - 35.1	24.8	19.6 - 30.0	26.5	20.6 - 32.4	29.0	20.4 - 37.6
1990	32.3	23.3 - 41.3	25.9	21.1 - 30.7	25.3	20.1 - 30.5	24.9	17.8 - 32.0
1991	26.0	18.5 - 33.5	30.1	25.2 - 35.1	25.0	19.8 - 30.2	23.8	17.1 - 30.5
1992	32.7	25.2 - 40.2	23.8	19.1 - 28.4	24.5	19.5 - 29.6	24.4	17.8 - 31.1
1993	21.7	14.7 - 28.7	27.5	22.6 - 32.3	23.6	19.1 - 28.1	21.0	15.3 - 26.7
1994	22.3	15.8 - 28.8	24.6	20.5 - 28.7	28.0	23.7 - 32.2	23.7	18.6 - 28.8
1995	21.3	5.8 - 19.6	29.3	24.6 - 34.0	28.7	24.2 - 33.1	22.4	17.8 - 27.1
1996	27.7	19.9 - 35.5	22.0	17.9 - 26.1	23.4	19.4 - 27.3	25.5	20.4 - 30.6
1997	28.7	20.7 - 36.6	21.4	17.7 - 25.1	24.8	20.7 - 28.9	21.0	16.1 - 25.8
1998	31.7	25.0 - 38.3	23.0	19.7 - 26.4	26.8	23.2 - 30.4	18.1	14.7 - 21.6
1999	29.3	23.9 - 34.6	19.7	17.1 - 22.3	22.1	19.5 - 24.7	20.7	17.8 - 23.7
2000	27.3	23.2 - 31.3	24.0	21.4 - 26.5	22.6	20.4 - 24.8	20.6	18.1 - 23.1
2001	28.0	23.9 - 32.1	24.2	21.8 - 26.6	22.3	20.1 - 24.5	19.7	17.4 - 22.0
2002	24.2	19.7 - 28.7	22.7	19.8 - 25.5	21.9	19.5 - 24.4	19.7	17.0 - 22.3
2003	28.1	23.1 - 33.2	23.4	20.5 - 26.3	21.5	19.1 - 23.9	18.6	16.2 - 21.1
2004	24.7	19.4 - 29.9	21.2	18.1 - 24.4	20.4	17.8 - 23.0	19.6	17.2 - 22.0
2005	22.9	17.5 - 28.3	22.7	19.3 - 26.1	19.2	16.9 - 21.6	19.4	17.0 - 21.7

TABLE 4 (continued)– PERCENTAGE OF ADULTS WHO CURRENTLY SMOKE, BY YEAR AND AGE, MA, 1986-2005

	55-64		65-74		75-99	
	%	95% CI	%	95% CI	%	95% CI
1986	26.6	18.1 - 35.0	16.2	9.3 - 23.1	10.3	4.1 - 16.4
1987	30.6	22.8 - 38.5	17.4	10.8 - 24.0	10.9	4.5 - 17.2
1988	25.3	16.9 - 33.8	15.9	10.3 - 21.4	10.7	4.3 - 17.1
1989	18.4	10.9 - 25.9	22.0	14.4 - 29.7	7.9	2.0 - 13.7
1990	20.8	13.6 - 28.1	21.5	13.5 - 29.5	5.9	0.1 - 11.6
1991	19.9	12.9 - 26.9	11.8	6.1 - 17.6	8.1	2.4 - 13.7
1992	28.8	20.7 - 37.0	11.2	6.3 - 16.0	5.6	0.6 - 10.7
1993	18.6	12.6 - 24.6	11.5	6.8 - 16.2	6.6	2.2 - 11.1
1994	17.7	12.4 - 23.0	15.6	10.4 - 20.8	12.7	5.8 - 19.6
1995	17.1	11.9 - 22.2	16.3	10.9 - 21.6	6.0	2.5 - 9.6
1996	27.3	20.2 - 34.4	18.2	12.2 - 24.1	8.2	3.2 - 13.2
1997	19.8	13.9 - 25.7	11.7	7.0 - 16.4	5.4	2.0 - 8.7
1998	20.5	15.5 - 25.5	9.4	6.3 - 12.5	4.8	1.8 - 7.8
1999	21.5	17.1 - 25.8	12.1	9.1 - 15.2	9.5	6.2 - 12.7
2000	17.1	14.3 - 19.9	12.3	9.8 - 14.7	4.7	2.9 - 6.6
2001	15.9	13.3 - 18.5	10.9	8.6 - 13.1	5.3	3.5 - 7.1
2002	17.3	14.4 - 20.3	12.0	9.3 - 14.8	4.3	2.6 - 6.0
2003	16.0	13.3 - 18.7	12.4	9.6 - 15.2	5.9	3.9 - 8.0
2004	18.3	15.6 - 20.9	10.2	7.8 - 12.6	5.9	3.6 - 8.2
2005	16.2	14.0 - 18.5	12.6	9.9 - 15.3	5.5	3.7 - 7.3

TABLE 5 – PERCENTAGE OF ADULTS WHO CURRENTLY SMOKE, BY AGE GROUPS, RACE/ETHNICITY, EDUCATION AND INCOME, MA, 2002-2004		
	%	95% CI
Age		
18-24	25.7	22.8 - 28.5
25-34	22.4	20.7 - 24.1
35-44	21.3	19.8 - 22.7
45-54	19.3	17.9 - 20.8
55-64	17.2	15.6 - 18.8
65-75	11.6	10.0 - 13.1
75-99	5.4	4.2 - 6.6
Race/Ethnicity		
White, NH	19.0	17.8 - 20.3
Black, NH	17.0	11.2 - 22.7
Hispanic	21.4	16.9 - 26.0
Education		
< High School	28.2	25.5 - 31.0
High School	26.9	25.4 - 28.4
College 1-3 Yrs	21.5	20.0 - 22.9
College 4+ Yrs	10.6	9.8 - 11.4
Income		
< $25,000	25.9	24.2 - 27.6
$25,000-34,999	24.9	22.3 - 27.4
$35,000-49,999	22.7	20.8 - 24.7
> $50,000	14.3	13.4 - 15.2

TABLE 6 – PERCENTAGE OF ADULTS WHO CURRENTLY SMOKE, BY YEAR AND EDUCATION*, MA, 1986-2005

	< 11 GRADE		HIGH SCHOOL OR GED		SOME COLLEGE 1-3 OR TECH SCHOOL		COLLEGE OR HIGHER	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
1986	36.2	30.9 - 47.7	33.4	27.7 - 38.6	26.3	19.0 - 30.9	20.2	14.1 - 23.3
1987	28.2	23.4 - 37.4	33.4	30.4 - 40.6	27.9	21.6 - 31.7	18.6	14.7 - 23.0
1988	41.4	35.9 - 51.0	31.4	28.4 - 38.4	27.1	20.4 - 30.7	15.3	10.4 - 17.8
1989	26.4	21.4 - 36.5	32.7	26.5 - 37.8	21.6	17.1 - 27.9	14.8	10.6 - 17.8
1990	31.9	25.4 - 41.2	28.3	25.3 - 35.2	22.0	17.9 - 28.4	14.2	10.7 - 18.1
1991	26.4	20.0 - 34.3	33.2	27.2 - 36.7	20.1	17.2 - 26.9	12.0	9.1 - 15.4
1992	29.0	23.1 - 39.7	29.4	26.8 - 36.3	21.0	18.2 - 28.1	13.7	10.8 - 17.0
1993	27.0	21.3 - 34.9	29.2	25.7 - 35.1	21.4	15.6 - 23.9	12.2	9.4 - 15.0
1994	27.4	23.4 - 36.1	29.8	25.4 - 33.5	23.4	19.4 - 27.6	13.4	9.9 - 15.1
1995	29.9	23.4 - 35.6	30.0	26.2 - 34.2	28.6	23.4 - 32.5	12.3	8.7 - 13.8
1996	33.2	25.0 - 37.7	30.5	27.3 - 35.6	23.6	20.0 - 28.8	10.1	8.4 - 13.9
1997	26.0	22.7 - 36.8	26.2	22.9 - 30.7	21.1	18.1 - 26.0	11.3	9.1 - 14.2
1998	34.1	28.9 - 42.1	26.4	24.6 - 31.1	21.6	20.4 - 27.1	9.2	7.9 - 11.5
1999	30.0	26.2 - 39.0	24.6	22.7 - 27.7	20.8	19.7 - 25.1	11.7	10.7 - 14.0
2000	27.5	24.5 - 32.6	24.9	23.6 - 28.0	21.4	20.1 - 24.5	11.7	10.9 - 13.6
2001	24.6	23.5 - 31.6	26.7	25.1 - 29.5	21.9	20.0 - 24.4	10.2	9.9 - 12.3
2002	27.7	25.8 - 35.5	25.9	24.2 - 29.2	20.8	17.9 - 22.6	10.4	9.2 - 11.8
2003	26.0	22.8 - 31.9	25.1	24.1 - 29.2	21.9	19.5 - 24.3	10.2	9.7 - 12.6
2004	25.9	21.9 - 31.1	26.5	24.6 - 30.3	22.4	19.6 - 25.1	9.8	8.9 - 11.6
2005	28.5	22.9 - 34.1	27.1	24.4 - 29.7	21.4	18.8 - 24.0	9.0	7.7 - 10.2

* age > 25 years old

TABLE 7 – SMOKING PREVALENCE AMONG DISABLED ADULTS BY EDUCATION AND INCOME, MA, 2002-2004		
	%	95% CI
Education		
< High School	34.7	27.6 - 41.8
High School	29.2	24.2 - 34.2
College 1-3 Yrs	25.1	20.4 - 29.7
College 4+ Yrs	15.1	11.7 - 18.4
Income		
< $25,000	30.1	26.6 - 33.6
$25,000-34,999	28.4	20.9 - 36.0
$35,000-49,999	26.2	20.2 - 32.3
$50,000-74,999	24.5	18.0 - 31.0
> $75,000	15.8	10.8 - 20.9

TABLE 8 – PERCENTAGE OF ADULTS REPORTING VARIOUS DISEASES BY SMOKING STATUS, MA, 2002-2004				
	EVER SMOKED		NEVER SMOKED	
	%	95% CI	%	95% CI
Asthma (ever had)	14.4	13.7 - 15.0	12.6	12.0 - 13.2
Diabetes	7.1	6.7 - 7.6	4.5	4.2 - 4.9
Hypertension	27.0	25.8 - 28.2	20.0	18.9 - 21.0
Stroke	2.8	2.2 - 3.4	2.0	1.5 - 2.6
Angina or CHD	9.0	8.1 - 10.0	7.7	6.8 - 8.6

TABLE 9 – HEALTH CARE STATUS FOR SMOKER, MA, 2002-2004		
	SMOKER	
	%	95% CI
No Insurance (age <65 Yrs)	35.4	31.9 - 39.0
Type Of Insurance		
Private	17.1	16.3 - 18.0
Public	37.4	34.0 - 40.8
Other	20.6	17.2 - 24.2

TABLE 10 – PERCENTAGE OF ADULTS WHO REPORT HEALTH CO-RISKS BY SMOKERS STATUS, MA, 2001-2004				
	SMOKER		NON-SMOKER	
	%	95% CI	%	95% CI
Any Exercise	71.5	70.0 - 72.9	80.4	79.8 - 81.0
Weight				
Normal Weight	49.3	47.6 - 51.0	45.1	44.3 - 45.9
Overweight	34.2	32.6 - 35.8	37.2	36.4 - 38.0
Obese	16.5	15.3 - 17.8	17.7	17.1 - 18.3
Binge Drinker	31.4	29.7 - 33.0	14.8	14.2 - 15.4
Heavy Drinker	14.3	13.0 - 15.6	5.4	5.0 - 5.8

TABLE 11 – PERCENTAGE OF THOSE REPORTING GOOD AND POOR HEALTH WHO ALSO REPORT SMOKING, MA, 2002-2004				
	POOR		GOOD	
	% Smokers	95% CI	% Smokers	95% CI
Physical Health	26.0	23.6 - 28.5	18.0	17.3 - 18.7
Mental Health	36.1	33.3 - 38.8	16.8	16.1 - 17.4

TABLE 12 – ADULTS WHO ARE HEAVY SMOKERS AMONG ALL CURRENT SMOKERS, BY SEX, AGE GROUPS, EDUCATION, AND INCOME, MA, 2002-2004		
	%	95% CI
Sex		
Male	13.9	11.3 - 16.5
Female	8.1	6.6 - 9.5
Age		
18-24	5.3	1.2 - 9.4
25-34	5.8	3.3 - 8.3
35-44	10.6	7.7 - 13.6
45-54	16.8	13.0 - 20.6
55-64	19.3	14.5 - 24.1
65-75	13.5	8.3 - 18.8
75-99	11.6	3.4 - 19.7
Education		
< High School	12.9	8.4 - 17.5
High School	14.5	11.6 - 17.4
College 1-3 Yrs	9.5	7.0 - 11.9
College 4+ Yrs	6.3	4.2 - 8.5
Income		
< $25,000	12.5	9.2 - 15.7
$25,000-34,999	15.9	9.7 - 22.1
$35,000-49,999	10.5	7.1 - 13.9
> $50,000	9.3	7.1 - 11.5

TABLE 13 – PERCENTAGE OF ADULTS WHO CURRENTLY SMOKE WHO HAD A QUIT ATTEMPT OR QUIT PLAN, BY AGE GROUPS, MA, 2002-2004				
	QUIT ATTEMPT		QUIT PLAN	
	%	95% CI	%	95% CI
Age				
18-24	70.6	64.0 - 77.3	30.9	23.8 - 38.1
25-34	59.8	54.7 - 64.9	38.4	33.0 - 43.7
35-44	60.1	55.6 - 64.5	32.8	28.4 - 37.2
45-54	57.9	53.1 - 62.7	36.2	31.2 - 41.3
55-64	50.6	44.5 - 56.8	33.1	26.8 - 39.4
65-75	51.0	42.6 - 59.3	38.0	29.2 - 46.8
75-99	50.9	37.8 - 64.1	33.5	20.0 - 47.1

TABLE 14 – AGE OF FIRST CIGARETTE AMONG ADULTS WHO CURRENTLY SMOKE, BY GENDER, MA, 2000-2002

	MALE		FEMALE	
	%	95% CI	%	95% CI
Age				
<= 7	2.7	2.1 - 3.3	0.7	0.4 - 0.9
8-17	74.3	72.9 - 75.8	71.5	70.2 - 72.8
18-24	20.8	19.5 - 22.1	24.2	23.0 - 25.5
25-34	2.1	1.6 - 2.5	2.8	2.3 - 3.2
35+	0.1	0.0 - 0.2	0.9	0.6 - 1.1

TABLE 15 – AGE OF REGULAR SMOKING AMONG ADULTS WHO CURRENTLY SMOKE, BY GENDER, MA, 2000-2002

	MALE		FEMALE	
	%	95% CI	%	95% CI
Age				
<= 7	0.9	0.5 - 1.2	0.3	0.1 - 0.4
8-17	51.0	49.2 - 52.7	46.7	45.2 - 48.2
18-24	42.6	40.9 - 44.3	44.5	43.0 - 46.0
25-34	4.9	4.2 - 5.6	6.9	6.2 - 7.7
35+	0.7	0.4 - 0.9	1.6	1.2 - 2.1

TABLE 16 – ANY EXPOSURE TO SECONDHAND SMOKE AMONG ALL ADULTS, BY TIME AND LOCATION OF EXPOSURE, MA, 2002-2004

	OVERALL		WORK		HOME		OTHER	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Time of Exposure								
Jan-June 2002	61.5	57.9 - 63.2	26.9	23.7 - 30.2	16.7	14.4 - 19.0	50.1	47.3 - 52.9
July-Dec 2002	61.8	59.0 - 64.8	23.0	19.8 - 26.3	17.0	14.6 - 19.4	51.5	48.3 - 54.6
Jan-June 2003	51.7	49.1 - 54.2	17.4	14.8 - 20.0	14.1	12.2 - 16.1	42.4	39.8 - 45.0
July-Dec 2003	50.5	46.4 - 54.5	14.3	10.8 - 17.8	14.8	11.8 - 17.7	40.3	36.3 - 44.2
Jan-June 2004	47.9	45.1 - 50.8	17.3	14.6 - 20.1	11.0	9.2 - 12.9	39.0	36.2 - 41.9
July-Dec 2004	46.3	43.7 - 48.9	18.8	16.0 - 21.6	13.0	11.1 - 14.9	34.2	31.7 - 36.7
Jan-June 2005	43.5	40.6 - 46.4	17.8	14.9 - 20.7	11.7	9.7 - 13.6	33.1	30.2 - 35.9
July-Dec 2005	46.0	42.9 - 49.2	16.5	12.7 - 20.3	13.1	11.0 - 15.2	37.2	34.0 - 40.5

TABLE 17 – OVERALL EXPOSURE TO SECONDHAND SMOKE AMONG ADULTS, BY TIME OF LOCATION AND EXPOSURE, MA, 2002-2005				
	1 HOUR OR LESS PER WEEK		> 1 HOUR PER WEEK	
	%	95% CI	%	95% CI
Time of Exposure				
Jan-June 2002	17.6	15.5 - 19.6	43.0	40.2 - 45.8
July-Dec 2002	17.6	15.4 - 19.9	44.3	41.2 - 47.4
Jan-June 2003	16.5	14.6 - 18.4	35.2	32.7 - 37.7
July-Dec 2003	15.6	12.8 - 18.4	34.9	31.0 - 38.8
Jan-June 2004	15.5	13.5 - 17.6	32.4	29.6 - 35.1
July-Dec 2004	14.8	12.9 - 16.6	31.5	29.0 - 34.1
Jan-June 2005	17.6	15.2 - 19.9	25.9	23.3 - 28.5
July-Dec 2005	19.0	16.4 - 21.6	27.0	24.0 - 30.1

TABLE 18 – PROLONGED EXPOSURE (>1 HR/WEEK) TO SECONDHAND SMOKE AMONG ADULTS, BY SEX AND AGE GROUP, MA, 2002-2004		
	%	95% CI
Sex		
Male	42.0	40.2 - 43.9
Female	31.3	29.8 - 32.7
Age		
18-24	62.8	58.2 - 67.3
25-34	44.2	41.4 - 47.1
35-44	37.4	35.1 - 39.8
45-54	32.8	30.4 - 35.2
55-64	32.3	29.4 - 35.1
65-75	20.2	17.3 - 23.1
75+	14.1	11.5 - 16.6
Race/Ethnicity		
White, NH	36.3	35.0 - 37.6
Black, NH	42.4	36.4 - 48.3
Hispanic	36.8	32.2 - 41.4
Asian, NH	28.4	21.4 - 35.4
Education		
< High School	40.1	35.8 - 44.4
High School	44.8	42.4 - 47.2
College 1-3 Yrs	40.7	38.3 - 43.2
College 4+ Yrs	28.7	27.1 - 30.3

TABLE 19 – PROLONGED EXPOSURE (>1 HR/WEEK) TO SECONDHAND SMOKE AMONG ADULTS, BY SEX, RACE/ETHNICITY AND LOCATION, MA, 2002-2004						
	WORK		HOME		OTHER PLACES	
	%	95% CI	%	95% CI	%	95% CI
Sex						
Male	14.6	13.0 - 16.2	12.0	10.7 - 13.3	27.4	25.7 - 29.1
Female	8.0	6.9 - 9.2	9.8	8.8 - 10.8	21.0	19.8 - 22.3
Race/Ethnicity						
White, NH	10.6	9.5 - 11.7	10.9	10.1 - 11.8	24.4	23.3 - 25.6
Black, NH	18.2	12.4 - 24.0	11.4	7.2 - 15.6	26.8	21.5 - 32.2
Hispanic	19.8	14.5 - 25.1	10.9	7.9 - 13.9	20.7	16.8 - 24.5

TABLE 20 – PERCENTAGE OF HOUSEHOLDS WITH "NO SMOKING" RULE AT HOME BY YEAR, MA, 1993-2005				
	CHILDREN IN HOME		NO CHILDREN IN HOME	
	%	95% CI	%	95% CI
1993	44.3	40.1 - 48.6	39.8	36.4 - 43.1
1994	46.9	43.0 - 50.8	44.6	41.6 - 47.6
1995	54.8	50.9 - 58.7	46.7	43.7 - 49.8
1996	***[26]		***	
1997	59.2	55.4 - 63.1	54.3	51.2 - 57.4
1998	60.5	57.3 - 63.7	56.9	54.3 - 59.4
1999	68.0	65.5 - 70.4	58.3	56.2 - 60.4
2000	71.3	69.4 - 73.3	62.1	60.5 - 63.7
2001	73.8	71.9 - 75.6	66.0	64.5 - 67.6
2002	73.4	71.2 - 75.6	65.2	63.4 - 67.0
2003	76.8	73.6 - 80.0	68.1	65.6 - 70.7
2004	80.1	77.5 - 82.6	71.9	69.8 - 74.0
2005	82.9	80.5 - 85.3	75.0	72.7 - 77.3

[26] Data collected in 1996 was insufficient to compute averages.

TABLE 21 – PERCENTAGE OF ADULTS LIVING IN A HOUSEHOLD WITH A "NO SMOKING IN HOME" RULE, BY RACE/ETHNICITY, EDUCATION, SMOKING STATUS, AND HOUSEHOLD STATUS, MA, 2001-2004

	%	95% CI
Race/Ethnicity		
White, NH	69.3	68.5 - 70.1
Black, NH	70.2	66.5 - 73.8
Hispanic	79.3	76.8 - 81.8
Asian, NH	79.9	75.6 - 84.2
Education		
< High School	64.5	61.7 - 67.2
High School	62.0	60.4 - 63.6
College 1-3 Yrs	67.0	65.4 - 68.6
College 4+ Yrs	78.6	77.6 - 79.6
Smoking Status		
Smokers	33.1	31.5 - 35.1
Non-smokers	79.1	78.4 - 79.8
Household Status		
Household with Children under 18	75.4	74.2 - 76.6
Other Households	67.3	66.3 - 68.2

GLOSSARY

Age of First Cigarette – The age at which an individual first smoked a cigarette (even one puff)

Age of Starting Smoking – The age at which an individual began to smoke regularly

Asthma – Applies to individuals if they had ever been told by a doctor, nurse, or other health care professional that they had asthma

Binge Drinker – Refers to individuals who consumed five or more drinks on any one occasion in the past month

Coronary Heart Disease (CHD)/Stroke – Applies to individuals if they had ever been told by a doctor, nurse, or other health care professional that they had coronary heart disease or stroke

Diabetes – Applies to individuals if they had ever been told by a doctor, nurse, or other health care professional that they had diabetes

Disability – Applies to individuals if, for at least one year, (1) they had an impairment that limited activities or caused cognitive difficulties, (2) they used special equipment or required help from others to get around, or (3) reported a disability of any kind.

Ever Smoker – A current or former smoker

Exposure to secondhand smoke at work -- Respondents who were employed or self-employed, were asked, "Thinking about the past 7 days, about how many hours a week were you exposed to other people's smoke when you were at work?"

Exposure to secondhand smoke at home -- All respondents were asked "Thinking about the past 7 days, about how many hours a week were you exposed to other people's smoke when you were at home?"

Exposure to secondhand smoke in other places -- All respondents were asked "Thinking about the past 7 days, about how many hours a week were you exposed to other people's smoke when you were in other places?"

Exposure to secondhand smoke -- In general, any exposure to secondhand smoke was determined by any report of secondhand exposure at work, home, or in other places. To determine the number of hours per week of exposure to secondhand smoke, the reported hours of exposure to secondhand smoke at work, home, and in other places were added together. For respondents who were not employed or self-employed, the reported hours of exposure to secondhand smoke at home and in other places were added together.

Fair/Poor Health – Respondents were asked to describe their overall health as excellent, very good, good, fair, or poor. Those responding fair and poor were combined.

Fair/Poor Mental Health – Respondents were asked to describe their mental health as excellent, very good, good, fair, or poor. Those responding fair and poor were combined.

Former Smoker – Someone who smoked at least 100 cigarettes in their lifetime but who does not currently smoke

Heavy Drinker – Refers to men who consumed more than 60 drinks in the past month and women who consumed more than 30 drinks in the past month.

Heavy Smoker – A current smoker who reported smoking 21 or more cigarettes per day was defined as a heavy smoker.

Hypertension – Applies to individuals if they had ever been told by a doctor, nurse, or other health care professional that they had hypertension

"No smoking at home" rule -- To determine the presence of a "no smoking at home" rule, respondents were asked, "Which statement best describes the rules about smoking in your home …" The response categories were: 1) no one is allowed to smoke anywhere, 2) smoking is allowed in some places or at some times, and 3) smoking is permitted anywhere. A response of "1) no one is allowed to smoke anywhere" is considered a "no smoking at home" rule.

Obese/Overweight – All respondents were asked to report their height and weight. Respondents were categorized based on their Body Mass Index (BMI), which equals weight in kilograms divided by height in meters squared. Using the Healthy People 2010 standards (HP2010), all adults with a BMI between 25.0-29.9 were classified as being overweight and adults with a BMI greater than or equal to 30.0 were classified as being obese.

Quit Attempt – Applies to individuals who stopped smoking for one day or longer in the past 12 months because they were trying to quit smoking

Quit Plan – Applies to individuals who express the intention of trying to quit smoking within the next 30 days

Secondhand Smoke – Secondhand smoke, also known as environmental tobacco smoke (ETS), is the combination of smoke exhaled by a smoker and smoke from a burning cigarette, cigar or pipe.

Smoker or Current Smoker - Someone who has smoked at least 100 cigarettes in their lifetime and currently smokes either some days or everyday

Statewide Smoke-Free Law -- The Massachusetts Smoke-free Workplace Law (MGL chapter 270, section 22, "An Act to Improve the Public Health in the Commonwealth"), effective 07/05/2004, prohibits smoking in workplaces, including private offices, taxis, restaurants and bars in order to protect employees and the public from secondhand smoke. This law amends the 1988 Massachusetts Clean Indoor Air Law. For more information, visit the Massachusetts Tobacco Control website at http://www.mass.gov/dph/mtcp/legal/workplacelaw.htm.

Type of Health Insurance – Respondents were asked if they had any type of health care coverage at the time of the interview. (Those who indicated that they had no coverage were asked a follow-up question to be certain that they had considered all types of health care coverage. This included health care coverage from their employer or someone else's employer, a plan that they had bought on their own, Medicare, MassHealth, and coverage through the military, or the Indian Health Service.)