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Legacy First Look Report **1**

*Cigarette Smoking Among Youth:
Results from the 1999 National
Youth Tobacco Survey*

June 2000



Preamble

In November 1998, Americans won an unprecedented victory in our nation's century long fight against tobacco use and abuse. A coalition of 46 state Attorneys General successfully settled their cases with the tobacco companies amounting to \$206 billion over the first 25 years. As part of the Master Settlement Agreement (MSA), a 501(c)(3) organization was established to reduce tobacco usage in the United States. Now known as the American Legacy Foundation (Legacy), it adopted four goals:

- Reduce youth tobacco use,
- Reduce exposure to secondhand smoke among all ages and populations,
- Increase successful quit rate among all ages and populations, and
- Decrease tobacco consumption among all ages and populations.

Legacy's Board of Directors represents a diverse mix of state governors, legislators, and Attorneys General; and experts in the medical, education, and public health fields. Members include the following:

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Past President American Medical Association

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Attorney General, Kansas

Kenneth Warner, PhD
Richard D. Remington Collegiate Professor of Public Health, University of Michigan

Purpose of the First Look Report Series

The purpose of the First Look Report Series is to provide brief research findings from the National Youth Tobacco Surveys and other tobacco use surveys. The series will cover a wide range of topics including tobacco use behaviors, attitudes and beliefs about tobacco, pro- and counter-tobacco marketing efforts, results of the American Legacy Foundation Initiatives, and other policies and programs related to tobacco use.

Dear Colleague:

Every day 3,000 young people become hooked on tobacco — and one-third of those will die prematurely because of it. Tobacco use in this country has a dramatic impact on the public's health causing illnesses that cost the nation millions in lost productivity, healthcare expenses, and ultimately the lives of loved ones. The November 1998 Master Settlement Agreement was an important moment in the fight against tobacco use. Today, not only have states begun to commit to tobacco control, but the American Legacy Foundation (Legacy) exists to assist in the tobacco fight.



Last year, Legacy in partnership with the CDC Foundation conducted a baseline National Youth Tobacco Survey. This school-based survey will be completed every two years providing important data on youth tobacco use. Beyond middle and high school student prevalence data, last Fall's survey captured a tremendous amount of information on the attitudes, knowledge, and behaviors of young people and tobacco use. We're excited to begin sharing the details of this eye-opening information with you in the **First Look** report that follows. *This report, for example, reveals that menthol cigarettes are popular with middle school students — 47 percent of students in grade six through eight report using this type of cigarette — just as a new menthol cigarette, Marlboro Milds hit the market with a major marketing campaign.*

Legacy has an ongoing commitment to conducting the kinds of research you will find here. Our aim is build a wealth of knowledge and a better understanding of what works to advance tobacco control and prevention. As Chair, I am pleased to share this report with you. I sincerely hope this report, and the many that follow, serve you well in eliminating tobacco use among our young people — and in our nation.

Sincerely,

A handwritten signature in blue ink that reads "Christine O. Gregoire".

Christine O. Gregoire
Attorney General, State of Washington
Chair, American Legacy Foundation

Legacy **First Look Report 1**

Cigarette Smoking Among Youth: Results from the 1999 National Youth Tobacco Survey

This report was written by Matthew C. Farrelly, PhD^{}, Dorothy L. Faulkner, PhD^{*}, and Paul Mowery, MS^{*}, from the American Legacy Foundation's Coordinating Center for Evaluation and Applied Research.*

The authors would like to acknowledge the contributions of Peter Messeri, PhD[†], Lonnie Bristow, MD[†], Kenneth Warner, PhD[†], Barbara Lynch, PhD[‡], and Jeffrey Wasserman, PhD[§], who reviewed drafts of this report.

The authors are also grateful to Kristin Thomas for providing statistical support, Andrew Jessup for graphic design, Susan Murchie for editorial review, and to all the schools in the survey for their cooperation.

The NYTS questionnaire was developed by the CDC Foundation and Macro International Inc. with technical support from the Office of Smoking and Health, CDC. Macro developed and implemented the NYTS sampling design, recruited schools, managed data collection and processing, and weighted the data with technical support from the Office of Smoking and Health.

*RTI †American Legacy Foundation ‡Prospect Associates §RAND

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Introduction

A recent report based on the 1999 National Youth Tobacco Survey (NYTS) highlighted that 12.8 percent of middle school students (grades 6 to 8) had used some form of tobacco in the past 30 days and that 9.2 percent of middle school students smoked cigarettes on at least one day in the past month (CDC, 2000). The NYTS provides a tremendous opportunity to understand youth tobacco use because it provides comprehensive information on tobacco use for a nationally representative sample of middle school and high school students in all grades.

The purpose of this brief report is to provide detailed information on cigarette smoking among youth, including the prevalence and intensity of smoking behavior as well as the characteristics of the cigarettes smoked by middle and high school students. It is the first in a series of reports from the American Legacy Foundation (Legacy) that will summarize findings from the NYTS and other surveys and studies conducted by Legacy.

1999 National Youth Tobacco Survey Design and Content

The 1999 NYTS was administered in the fall of 1999 to 15,058 students in grades 6 to 12 in 131 schools across the country. Students completed an anonymous, self-administered questionnaire that included questions about tobacco use, exposure to environmental tobacco smoke, minors' ability to purchase tobacco products, the price paid for cigarettes, knowledge and attitudes about tobacco, and familiarity with pro- and anti-tobacco advertising.

The NYTS was designed to produce a nationally representative sample of students in grades 6 to 12. To ensure separate analysis of African-American and Hispanic students, schools with substantial proportions of African-American and Hispanic students were oversampled. A weighting factor was applied to each student to adjust for nonresponse and for the probability of selection, including oversampling of African-American and Hispanic students. The 1999 NYTS did not have a sufficiently large sample size to permit separate analysis of other racial/ethnic groups (see Table 1). However, we anticipate that the spring 2000 NYTS will have sample sizes to permit nationally representative samples for African-Americans, Asian-Americans, Hispanics, and whites.

In addition to the categories of questions listed above, the NYTS asks respondents their age, gender, grade, and two questions about race/ethnicity. The first race/ethnicity question asks, “How do you describe yourself? (You can choose one answer, or more than one),” and the second question asks, “Which one of these groups best describes you? (Choose only one answer).” In both cases, the choices are as follows:

- American Indian or Alaska Native
- Asian
- Black or African-American
- Hispanic or Latino
- Native Hawaiian or Other Pacific Islander
- White

For the purposes of this report, we use the second question to characterize race/ethnicity.¹ The sample characteristics are summarized in Table I.

Table I: Sample Characteristics of the 1999 NYTS, N=15,058

Demographic Characteristic	Mean
Age	13.9
Percent Female	49.9
Percent American Indian or Alaska Native	2.1
Percent Asian	3.8
Percent African-American	16.5
Percent Hispanic	18.4
Percent Native Hawaiian or Other Pacific Islander	1.2
Percent White	58.0

¹Readers are asked to keep in mind that these racial and ethnic categories should not be interpreted as being primarily biological or genetic in reference. Race and ethnicity may be thought of in terms of social and cultural characteristics, as well as ancestry (OMB, 1997).

Main Findings

In the current report, we focus our attention on cigarette smoking behavior among middle and high school students. The questions in the 1999 NYTS pertaining to cigarette use are listed in Table 2. They include both measures of lifetime smoking as well as current (past 30 day) smoking. Our analysis of lifetime smoking focuses on the age of first use and indicators of any lifetime smoking and lifetime daily smoking. We then examine patterns of current cigarette use as well as cigarette brand and menthol preferences.

Table 2: Cigarette Smoking Behavior Questions from the 1999 NYTS

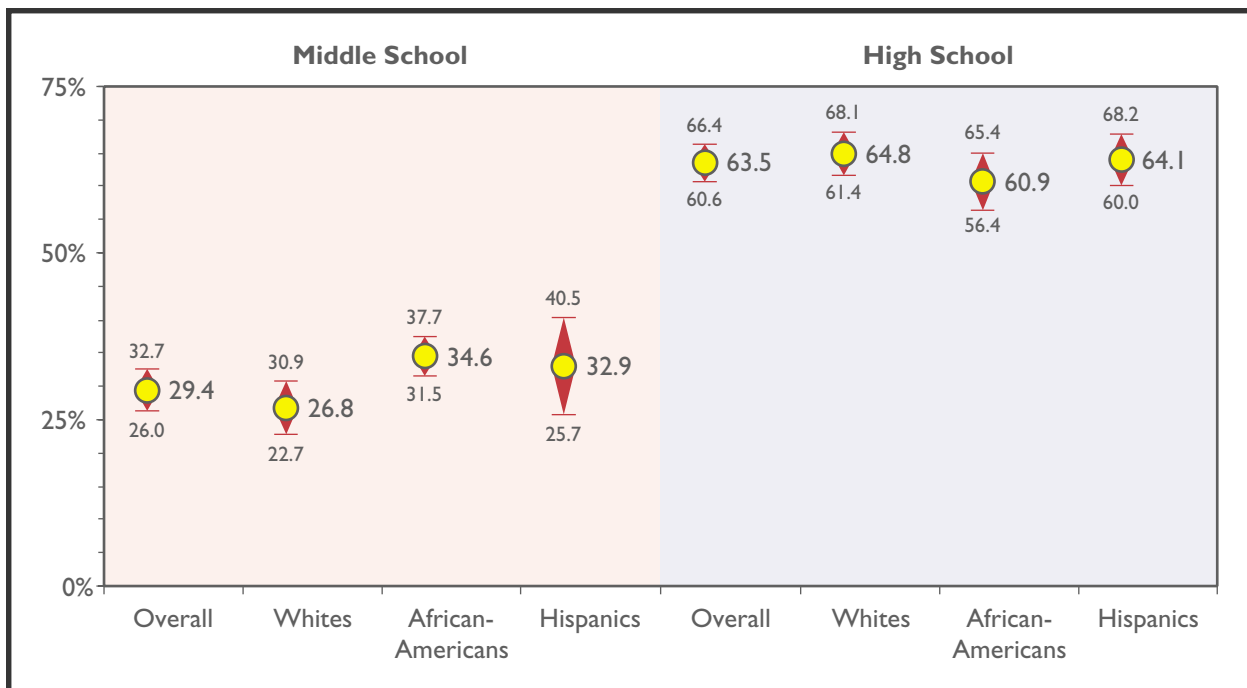
Question
Have you ever tried cigarette smoking, even one or two puffs?
How old were you when you smoked a whole cigarette for the first time?
About how many cigarettes have you smoked in your entire life?
Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?
During the past 30 days, on how many days did you smoke cigarettes?
During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
During the past 30 days, what brand of cigarettes did you usually smoke?
Is the brand of cigarettes you usually smoked during the past 30 days mentholated?

Lifetime Smoking

We begin our discussion of tobacco use by highlighting the prevalence of lifetime cigarette use, including measures of any lifetime use, regular use, and the age of first use. Figure 1 presents estimates (and 95 percent confidence intervals) of lifetime prevalence for middle school and high school students and for African-Americans, Hispanics, and whites separately to illustrate possible racial/ethnic differences.

As illustrated in Figure 1, nearly two-thirds of high school students and nearly one-third of middle school students have at least tried a puff or two of a cigarette. Middle school African-Americans and Hispanics in the fall NYTS sample are more likely to have tried smoking than whites, although these differences are not statistically significant. However, what racial/ethnic differences might be present in middle school are absent during the high school years. In both middle school and high school, there are not statistically significant gender differences (data not shown).

Figure 1: Prevalence of Ever Smoking for Middle and High School Students

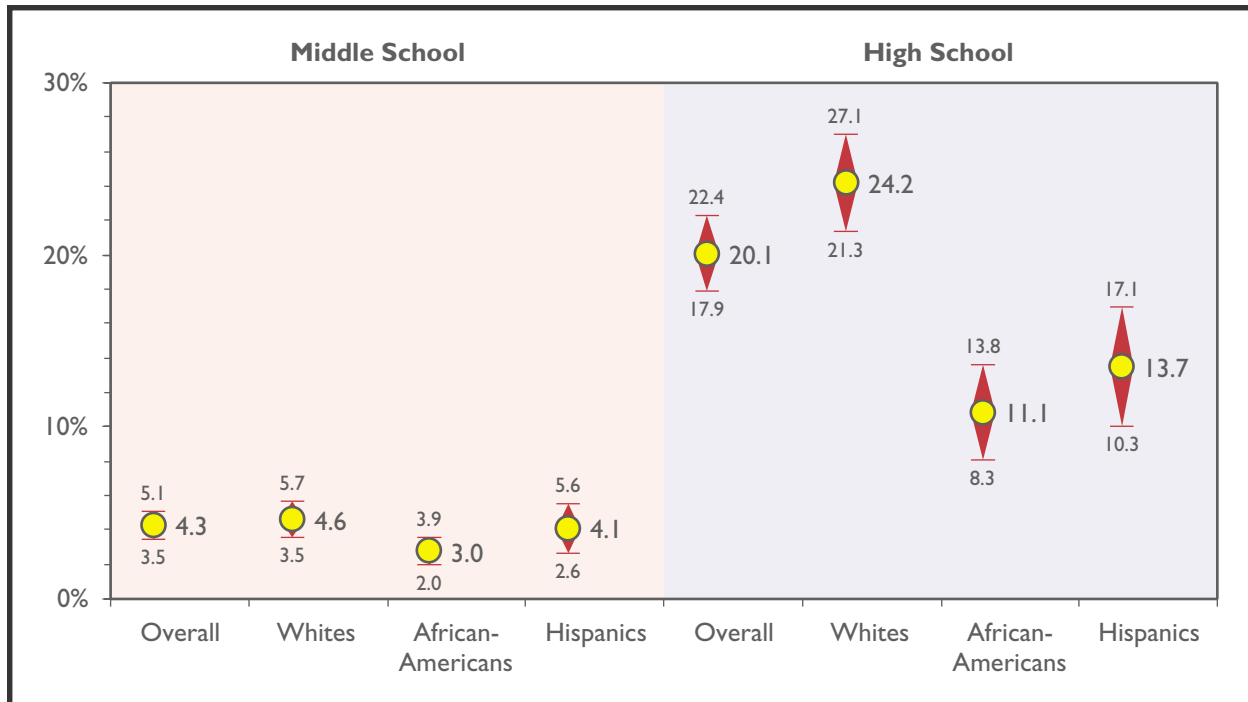


Note: Upper and lower ranges represent 95 percent confidence intervals that account for the survey design weighting.

In Figure 2, we examine a lifetime measure of regular smoking, “ever smoked daily.” This measure serves as a contrast to the measure of ever tried smoking to indicate progression to regular smoking. For this measure, there are more distinct differences by school level and by race/ethnicity. In the middle school grades, a very small proportion of students has ever smoked daily — roughly 4 percent overall.

By the high school grades, the proportion of lifetime regular smokers has increased dramatically to 20 percent. Consistent with many other studies and surveys, African-Americans and Hispanics are less likely to smoke than whites. In this sample, these differences are statistically significant. In the NYTS 1999 data, 24.2 percent of whites have smoked daily, while African-Americans and Hispanics are roughly half that rate, or 11.1 percent and 13.7 percent, respectively.

Figure 2: Prevalence of Ever Smoking Daily for Middle and High School Students



Note: Upper and lower ranges represent 95 percent confidence intervals that account for the survey design weighting.

Current Smoking

The NYTS has a wealth of information pertaining to current cigarette use, including the prevalence of current use, brand and menthol preferences, daily consumption, and days smoked in the past month. Current cigarette smoking is commonly defined based on cigarette smoking in the past month. Reports from CDC and the Monitoring the Future Study use a definition that is based on smoking at least one day in the past 30 days. However, an alternative measure of smoking that represents more regular or frequent smokers is based on smoking on 20 or more days in the past month. Figures 3 and 4 illustrate the prevalence of both of these measures by school level and race.²

Prevalence of Smoking

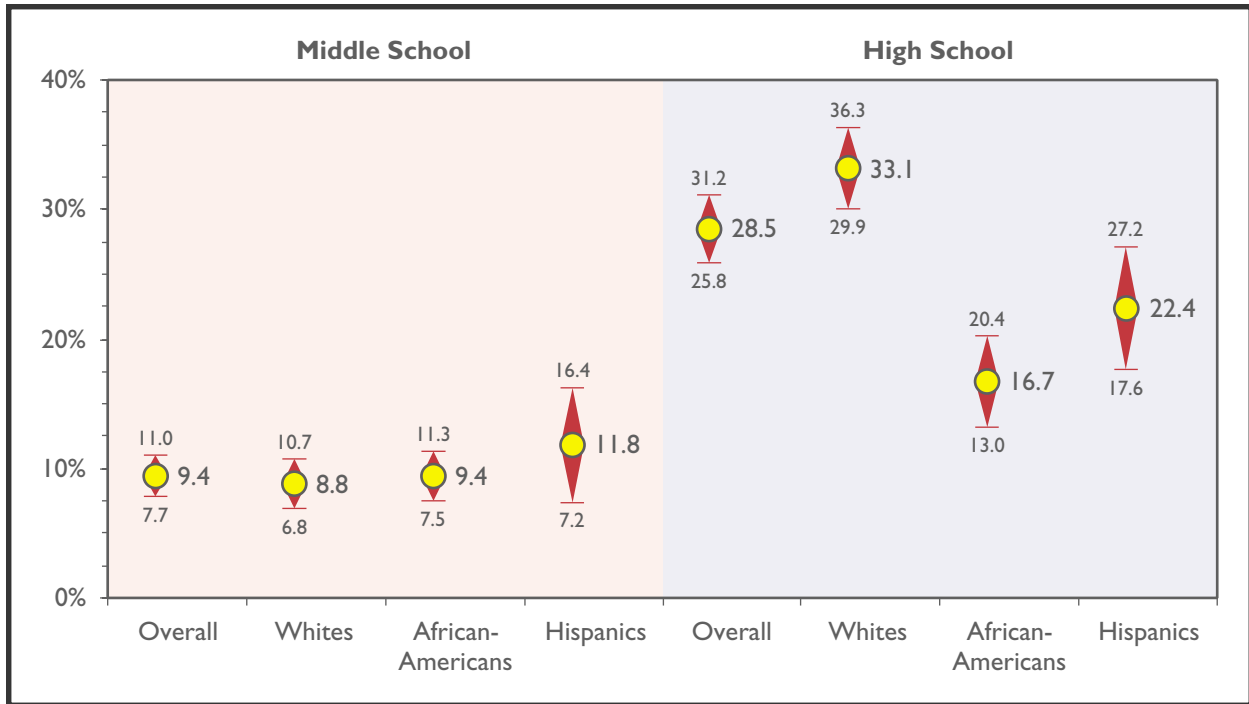
Figure 3 reiterates a point made in the recent CDC report (CDC, 2000) that first summarized the NYTS 1999 data. This graphic representation shows that while African-Americans and Hispanics are less likely than whites to smoke in high school, they are equally likely to smoke in middle school grades. Specifically, Figure 3 shows that among high school students, smoking on one or more days in the past month is nearly twice as prevalent among whites as among African-Americans and 48 percent greater among whites than Hispanics. (Both of these differences are statistically significant.)

To further illustrate the differential patterns in cigarette use by race/ethnicity, we also graph the prevalence of current use by grade and race/ethnicity in Figure 4. This figure describes age-related changes in prevalence that differ by race/ethnicity. Further research is necessary to gain a better understanding of how and why these differences emerge (see Table A-I in Appendix A for details on the prevalence of smoking by grade, gender, and race).

There are no meaningful differences in the 30-day prevalence of smoking among boys and girls in middle and high school grades. Approximately 10 percent of middle school boys smoked on any days in the past 30 days compared to 9 percent of girls. Similarly, in high school grades, 28.7 percent of boys and 28.2 percent of girls smoked on at least one day in the past month.

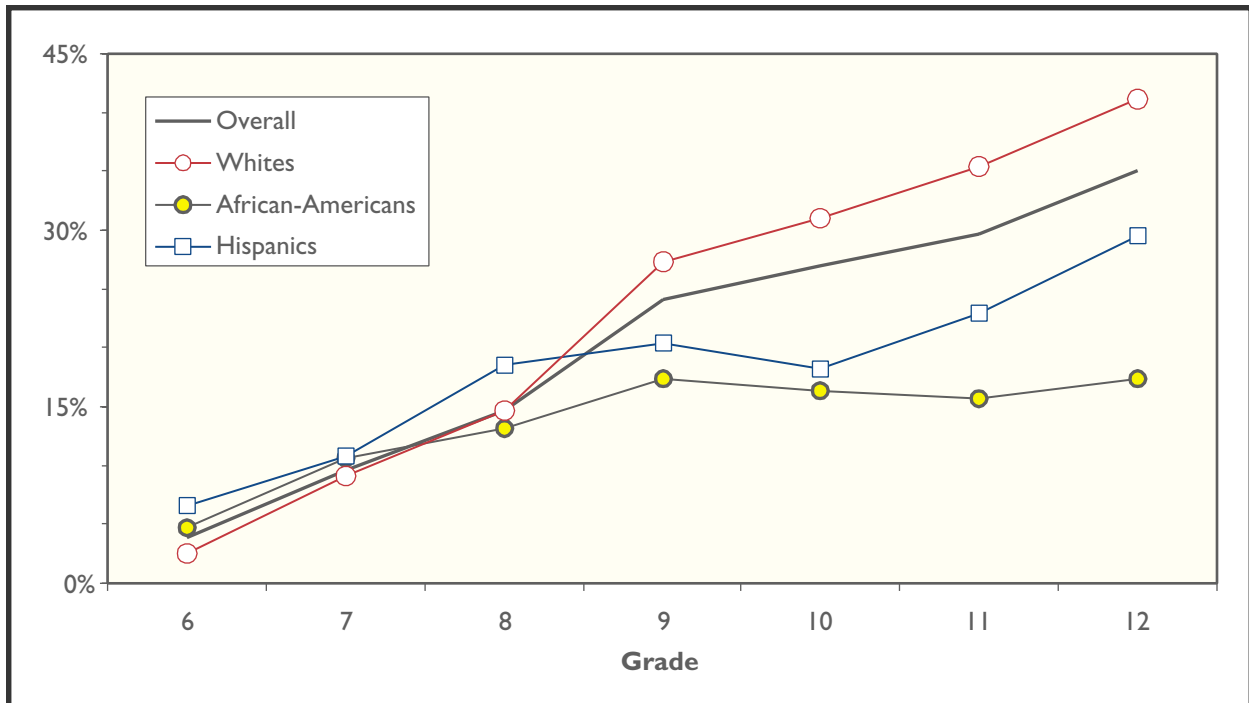
²Defining the prevalence of smoking in the past 30 days in the NYTS is complicated by the fact that there are a number of questions in the survey that pertain to smoking on any of the past 30 days. As a result, there are some inconsistencies across the multiple questions. Appendix B provides a summary of how these differences were reconciled. After coding for inconsistencies, the prevalence of smoking was not very different. Therefore, reported prevalence is based on smoking on at least one day in the past 30 days.

Figure 3: Prevalence of Smoking on ≥ 1 Days in the Past 30 Days Among Middle and High School Students



Note: Upper and lower ranges represent 95 percent confidence intervals that account for the survey design weighting.

Figure 4: Prevalence of Smoking on ≥ 1 Days in the Past 30 Days by Grade and Race/Ethnicity



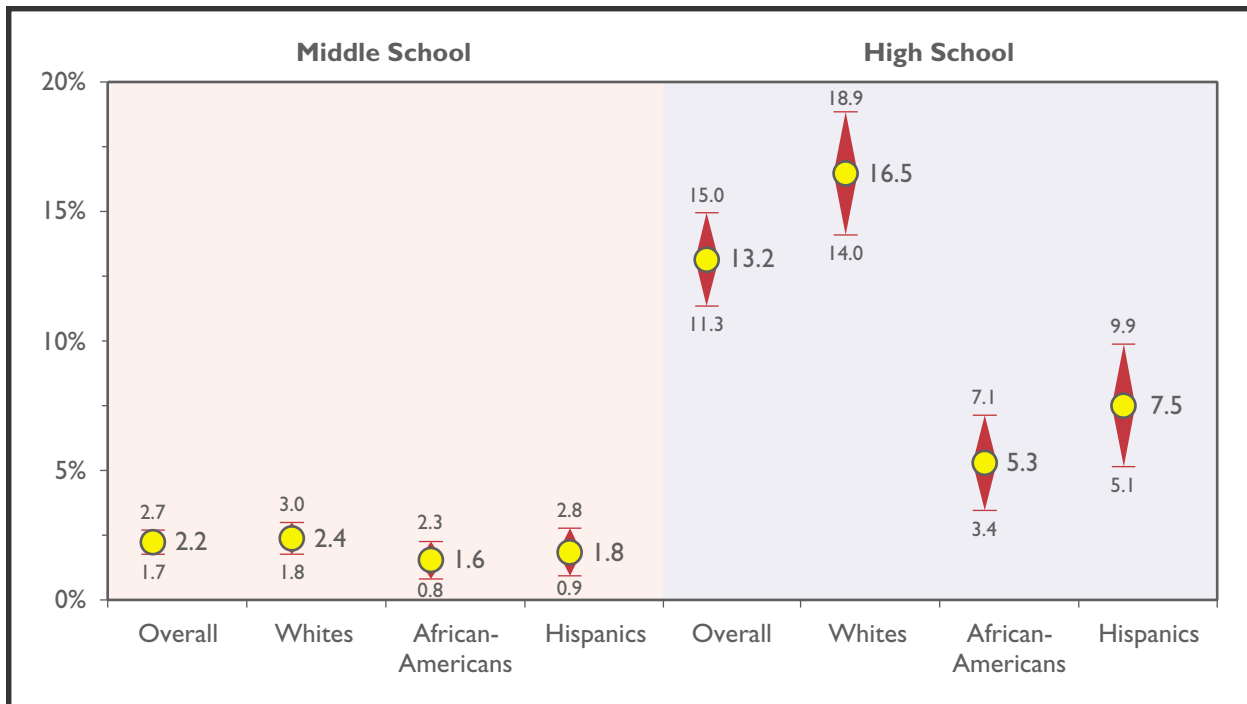
Prevalence of Frequent Smoking

Because current smokers, as defined above, fall along a spectrum of those who smoke for a few days to every day smokers, we present a measure of more regular current smoking based on smoking 20 or more days in the past month.

As expected, Figure 5 shows that a very low proportion (roughly 2 percent) of middle school smokers progressed to regular smoking. Consistent with Figure 4, there are no statistically significant differences among race/ethnicity groups in middle school. However, in high school, not only are African-Americans and Hispanics less likely to be frequent smokers than whites, the relative difference is more pronounced among frequent smokers than the one or more day smokers. For frequent smoking, Figure 5 shows that whites are roughly three times more likely to smoke than African-Americans and more than twice as likely to smoke as Hispanics.

As with the prevalence of “any day” smoking, there are no statistical differences by gender in the prevalence of frequent smoking.

Figure 5: Prevalence of Frequent Smoking (≥20 days) in the Past 30 Days Among Middle and High School Students



Note: Upper and lower ranges represent 95 percent confidence intervals that account for the survey design weighting.

Daily Cigarette Consumption

To illustrate the intensity of cigarette smoking, we summarize the average number of cigarettes smoked per day among “any day” and frequent smokers. The NYTS question on cigarettes smoked per day on the days smoked in the past month is reported in the following categories: I did not smoke cigarettes during the past 30 days; less than 1 cigarette per day; 1 cigarette per day; 2 to 5 cigarettes per day; 6 to 10 cigarettes per day; 11 to 20 cigarettes per day; and more than 20 cigarettes per day.

To create a more continuous measure, we set the first category to 0 cigarettes per day and the top category to 25 cigarettes per day. The second category was set to 0.5 cigarettes per day, and the third category remained equal to 1 cigarette per day. The other categories were set to the midpoint of the ranges.

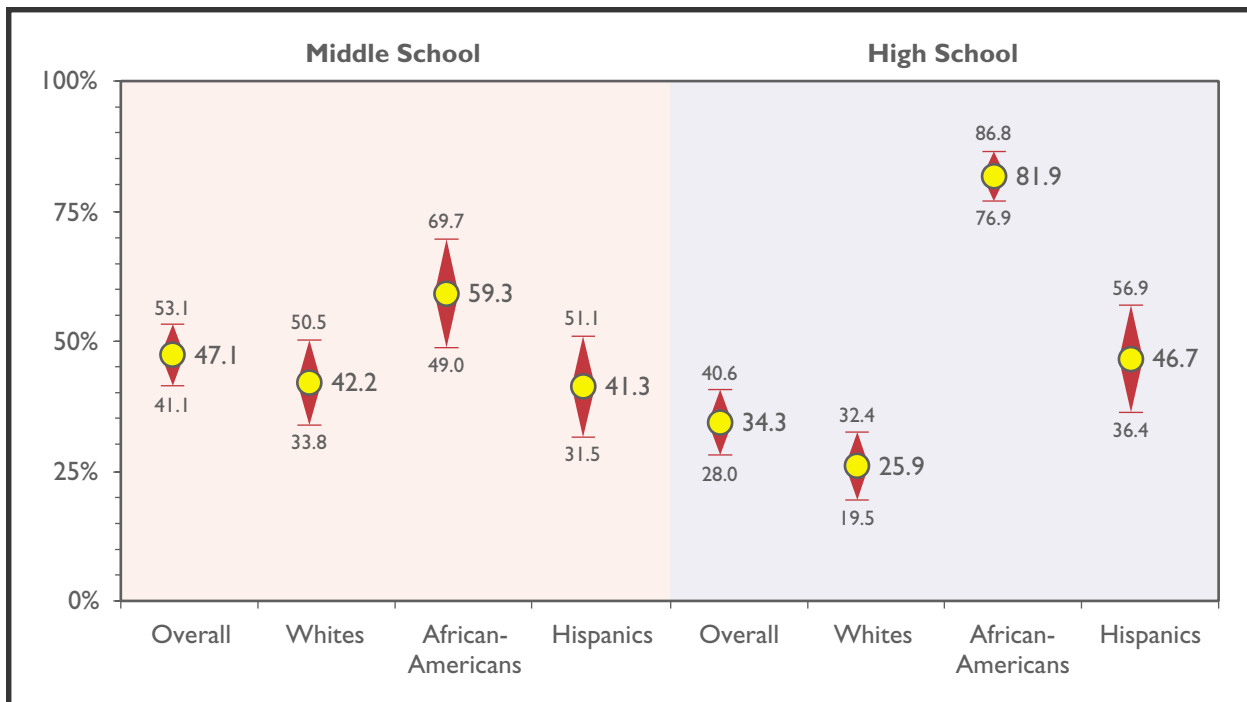
Overall, current any day smokers (95 percent confidence interval) smoke 3.9 (3.2, 4.6) cigarettes per day on average in middle school and 5.4 (5.0, 5.8) cigarettes in high school. As expected, those who are more frequent smokers (≥ 20 days) smoke considerably more cigarettes (95 percent confidence interval) — 10.6 (8.6, 12.7) and 9.2 (8.7, 9.7) for middle and high school, respectively. Although the average use among frequent smokers is higher in middle school than in high school, the confidence interval for the middle school students is larger because there are so few frequent smokers (N=186). Table A-2 in Appendix A provides more detailed information on the patterns of current cigarette consumption.

Menthol Cigarettes

The NYTS asks all students, “Is the brand of cigarettes you usually smoked during the past 30 days mentholated?” The patterns of menthol cigarette use among current any day smokers are intriguing (Figure 6). Roughly 47 percent of current middle school smokers use menthol cigarettes, but this number drops to 34 percent by high school. It may be that adolescents find mentholated cigarettes easier to smoke, but eventually graduate to non-menthol cigarettes once they are more accustomed to smoking. Hymowitz and colleagues (1995) surveyed adults who smoked menthol cigarettes and found that the reasons stated for smoking menthol included better taste, less harsh on the throat, and easier to inhale deeply.

In Figure 6, we report menthol use by race/ethnicity and find that use decreases from middle to high school among whites but increases for African-Americans and Hispanics. Use among African-Americans is higher than whites at both school levels and increases from 59.3 to 81.9 percent from middle to high school. Both of these differences are statistically significant.

Figure 6: Prevalence of Menthol Cigarettes Among Current Middle and High School Smokers



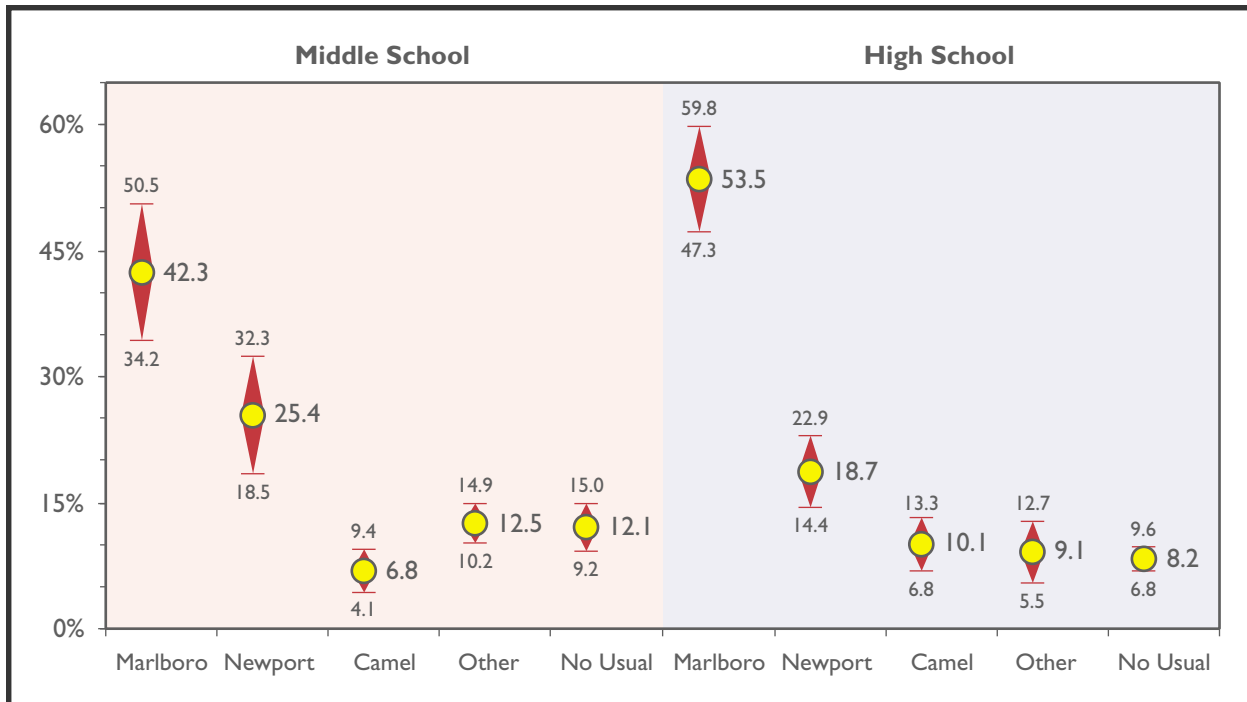
Note: Upper and lower ranges represent 95 percent confidence intervals that account for the survey design weighting.

Brand Preferences

The final characteristic of youth smoking for discussion is cigarette brand preferences. Figure 7 illustrates overall brand preferences among middle and high school students. In both middle school and high school, Marlboro is the top selling brand, followed by Newport and Camel.

Table A-3 in Appendix A highlights brand preference by gender and race among middle and high school smokers. The top brand among current smokers varies dramatically by race. The top selling brand among whites and Hispanics is Marlboro and among African-Americans is Newport. Camels come in third for all three race/ethnic groups. A small fraction has no usual brand.

Figure 7: Brand Preferences Among Middle and High School Smokers



Note: Upper and lower ranges represent 95 percent confidence intervals that account for the survey design weighting.

References

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- Hymowitz, N., C. Moulton, and H. Edkholdt. 1995. "Menthol Cigarette Smoking in African Americans and Whites" (letter). *Tobacco Control* 4(2):194-195.
- Office of Management and Budget (OMB). October 30, 1997. "OMB Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity." *Federal Register* 62(210):58781-58790. <<http://www.clhc.org/3cl-1.htm>>.

Appendix A:

Cigarette Smoking Statistics —

Detailed Tables

Table A-1: Prevalence of Smoking By Grade — 1999 NYTS [95% Confidence Interval]

Grade	Overall	Boys	Girls	Whites	African-Americans	Hispanics
6	3.9% [2.7, 5.2]	4.1% [2.5, 5.7]	3.6% [2.0, 5.3]	2.6% [1.7, 3.5]	4.7% [2.5, 6.8]	6.6% [1.1, 12.1]
7	9.6% [7.7, 11.5]	10.4% [8.0, 12.8]	8.6% [6.7, 10.5]	9.1% [6.6, 11.6]	10.6% [8.5, 12.7]	10.7% [6.7, 14.8]
8	14.7% [11.8, 17.6]	14.6% [11.4, 17.7]	14.9% [11.4, 18.4]	14.6% [10.8, 18.4]	13.2% [9.7, 16.6]	18.5% [12.5, 24.5]
9	24.1% [21.1, 27.2]	24.2% [20.7, 27.7]	24.0% [19.5, 28.5]	27.3% [22.5, 32.1]	17.4% [13.0, 21.9]	20.3% [14.3, 26.4]
10	27.0% [23.0, 31.1]	27.0% [22.9, 31.1]	27.1% [21.5, 32.6]	31.0% [25.8, 36.2]	16.3% [8.2, 24.5]	18.3% [10.9, 25.6]
11	29.7% [25.1, 34.2]	29.5% [25.2, 33.7]	29.6% [23.6, 35.5]	35.4% [30.2, 40.7]	15.6% [8.6, 22.6]	22.9% [14.4, 31.4]
12	35.1% [30.5, 39.7]	36.3% [31.0, 41.6]	34.0% [28.3, 39.6]	41.2% [36.0, 46.3]	17.3% [11.7, 22.9]	29.5% [23.4, 35.6]

Table A-2: Cigarettes Smoked Per Day on the Days Smoked by Type of Smoker — 1999 NYTS [95% Confidence Interval]

	Middle School		High School	
	≥1 Day Smoker (N=791)	≥20 Day Smoker (N=186)	≥1 Day Smoker (N=1972)	≥20 Day Smoker (N=919)
Overall	3.9 [3.2, 4.6]	10.6 [8.6, 12.7]	5.4 [5.0, 5.8]	9.2 [8.7, 9.7]
Boys	4.6 [3.4, 5.8]	11.8 [8.8, 14.7]	6.0 [5.5, 6.6]	10.0 [9.3, 10.7]
Girls	3.2 [2.7, 3.6]	9.1 [7.5, 10.7]	4.8 [4.2, 5.3]	8.2 [7.4, 8.9]
Whites	4.1 [3.5, 4.8]	10.4 [8.8, 12.0]	5.6 [5.1, 6.1]	9.0 [8.4, 9.6]
African-Americans	2.9 [2.0, 3.7]	7.1 [4.5, 9.7]	4.7 [3.6, 5.9]	10.5 [8.3, 12.8]
Hispanics	3.2 [1.7, 4.8]	11.2 [4.6, 17.8]	4.0 [3.1, 5.0]	8.4 [6.4, 10.4]

Table A-3: Brand Preference Among Smokers in Middle and High School

	Middle School				
	Marlboro	Newport	Camel	Other	No Usual
Overall	42.3% [34.0, 50.7]	25.4% [18.4, 32.5]	6.8% [4.1, 9.5]	12.5% [10.1, 14.9]	12.1% [9.1, 15.1]
Boys	44.5% [35.6, 53.4]	24.9% [17.0, 32.8]	8.3% [4.5, 12.0]	12.0% [8.8, 15.2]	9.0% [5.8, 12.2]
Girls	40.2% [30.3, 50.1]	25.8% [17.5, 34.1]	5.4% [2.5, 8.2]	13.3% [9.7, 16.9]	15.0% [10.4, 19.6]
Whites	47.6% [38.8, 56.3]	17.1% [10.8, 23.5]	8.4% [4.9, 12.0]	13.3% [9.9, 16.8]	13.3% [9.3, 17.3]
African-Americans	8.0% [2.2, 13.8]	60.3% [45.6, 75.0]	1.4% [-0.7, 3.6]	16.6% [9.6, 23.6]	10.2% [4.4, 16.0]
Hispanics	62.8% [46.2, 79.4]	10.7% [2.4, 19.0]	7.5% [-0.4, 15.4]	6.3% [1.7, 10.9]	12.8% [6.4, 19.2]
	High School				
	Marlboro	Newport	Camel	Other	No Usual
Overall	53.5% [47.2, 59.9]	18.7% [14.3, 23.0]	10.1% [6.8, 13.4]	9.1% [5.5, 12.8]	8.2% [6.8, 9.6]
Boys	51.1% [43.9, 58.2]	18.5% [13.8, 23.2]	13.2% [9.0, 17.5]	8.4% [5.2, 11.5]	8.4% [5.9, 10.9]
Girls	56.2% [49.5, 62.9]	18.6% [13.9, 23.3]	6.9% [4.1, 9.6]	9.9% [5.0, 14.8]	8.0% [6.1, 9.9]
Whites	60.0% [53.7, 66.1]	11.5% [8.0, 15.1]	12.2% [8.3, 16.1]	7.2% [4.7, 9.7]	8.9% [7.0, 10.8]
African-Americans	9.1% [3.0, 15.2]	59.2% [37.1, 81.2]	0.5% [-0.5, 1.4]	24.2% [1.3, 47.0]	5.3% [0.9, 9.7]
Hispanics	51.7% [38.9, 64.5]	30.3% [20.0, 40.5]	4.6% [0.5, 8.7]	6.4% [3.6, 9.1]	6.3% [3.6, 9.0]

Appendix B:

Definition of Current Smoking Status

Objective

The 1999 National Youth Tobacco Survey (NYTS) does not utilize skip patterns. As a result, respondents have opportunities to answer questions inconsistently. In addition, there are several questions that indicate current cigarette use (e.g., use in the past 30 days, brand preference, source of cigarettes). To determine current smoking status, it is necessary to develop decision rules to account for the absence of skip patterns, inconsistent reports of tobacco use, and missing data. For example, if we determine current smoking status on use in the past 30 days alone, will this accurately characterize smokers in the survey? This summary outlines a method to determine smoking status using a full set of cigarette use questions. The methodology explained below is illustrated in Figures B-1 through B-3.

Methodology

In order to determine an overall smoking status, two smoker variables were created: Smoker A and Smoker B. Smoker A relies heavily on the standard CDC definition of current youth smoking: at least 1 day of smoking in the past 30 days. However, because there are a number of alternative indicators of smoking, we created an alternative measure, Smoker B, and reconciled the two indicators to determine a comprehensive definition of smoking based on all of the various questions pertaining to current cigarette smoking.

Smoker A

Two questions were used to determine Smoker A. First, respondents were asked “Have you ever tried cigarette smoking, even one or two puffs?” (‘Ever Tried’). After determining the distribution of responses to

this question, we then examined the frequency of responses to the following question, “During the past 30 days, on how many days did you smoke cigarettes?” (“Days”) for each of the Ever Tried responses. Based on these two questions, we created Smoker A, where smoking status is “Smoker” if a respondent smoked on one or more days, “Non-smoker” if a respondent reported 0 days, and “Missing” if the respondent skipped the question. Although there were a number of respondents with missing information on one or both of the questions, there were no contradictions between these two questions.

The final weighted prevalence of smoking based on this algorithm is 19.63 percent (N=14,533)

Smoker B

The smoking status of Smoker B was based on the following five alternative indicators of smoking status:

- During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
- During the past 30 days, what brand of cigarettes did you smoke?
- Is the brand of cigarettes that you usually smoke during the past 30 days mentholated?
- During the past 30 days, how did you usually get your own cigarettes?
- When was the last time you smoked a cigarette, even one or two puffs?

Each indicator is a test condition that was either “True” if it indicated current cigarette use, “False” if it did not indicate current cigarette use, or “Missing” if the respondent skipped the question. If all non-missing test conditions were “True,” then smoking status was set to “Smoker.” If all non-missing test conditions were “False,” then smoking status was set to “Non-smoker.” If there were any contradictions within the set of five test conditions, then smoking status was set to “Missing.”

Final Smoking Status

The final stage to determine an overall smoking status began with a validity check, where the five alternative indicators of smoking status were examined. If less than three questions were answered, then the overall smoking status was automatically set to the smoking status of Smoker A. In other words, we do not alter (overturn) the index smoking status (Smoker A) based on two or fewer questions.

However, if three or more questions were answered, then Smoker A was examined more closely. If the smoking status of Smoker A was “Missing,” we default to the smoking status in Smoker B. This allows us to determine the smoking status of over 400 respondents. Otherwise, Smoker A was compared to Smoker B. If the smoking status of Smoker A and Smoker B matched, then the respondent was consistent in reporting cigarette use, and overall smoking status was set to the smoking status of Smoker A. If a contradiction existed between the smoking status of Smoker A and Smoker B, then the overall smoking status was set to “Missing.” This occurred in 598 cases.

In the end, the final weighted prevalence of smoking based on this algorithm, 19.27 percent (N=14,173), is not that different than the CDC standard definition. However, this method provides a clear and consistent way to address the issue of missing and inconsistent information. We feel this is a notable consideration for the NYTS, which is administered to respondents as young as 6th grade.

Figure B-I. Decision Tree for Smoker A

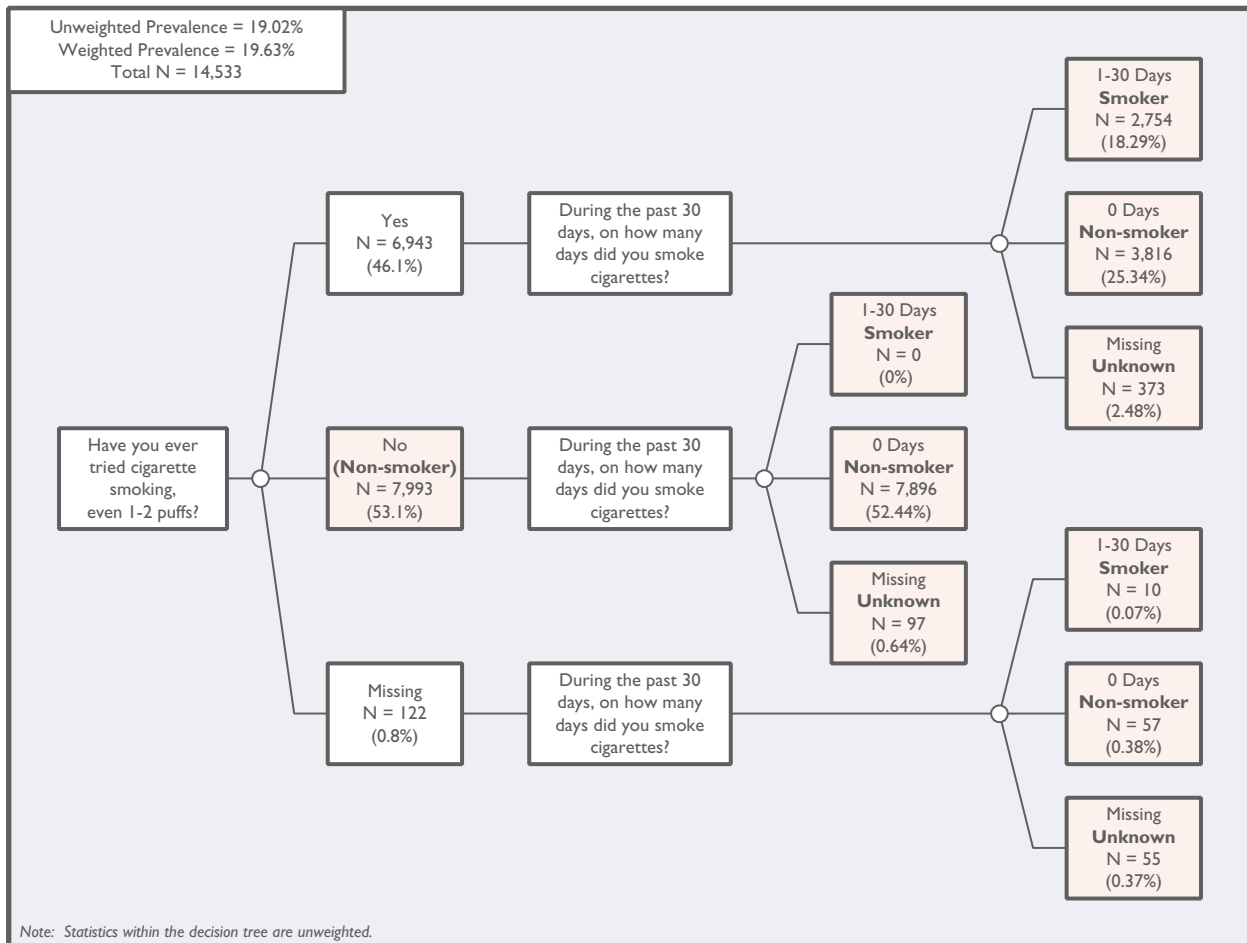


Figure B-2. Decision Trees for Smoker B

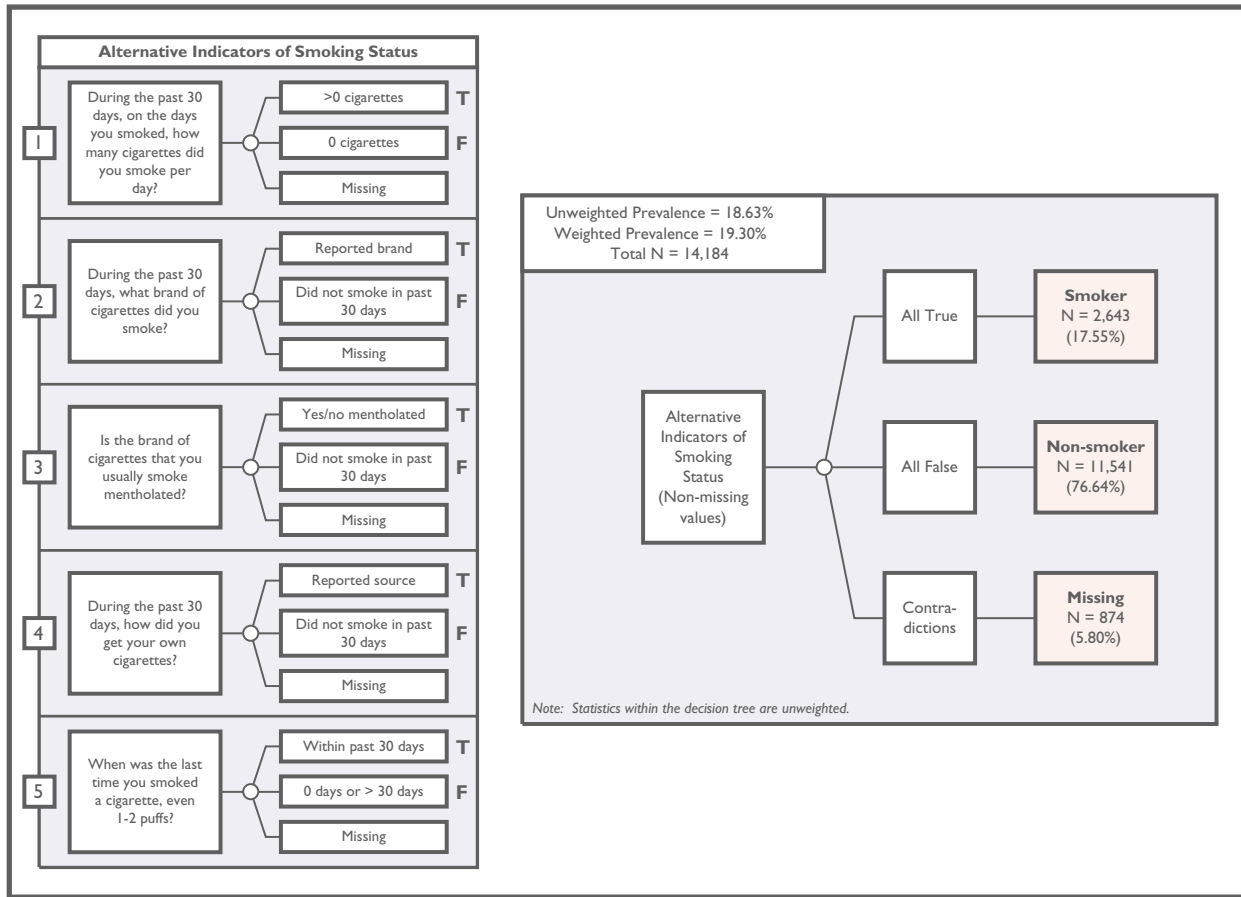
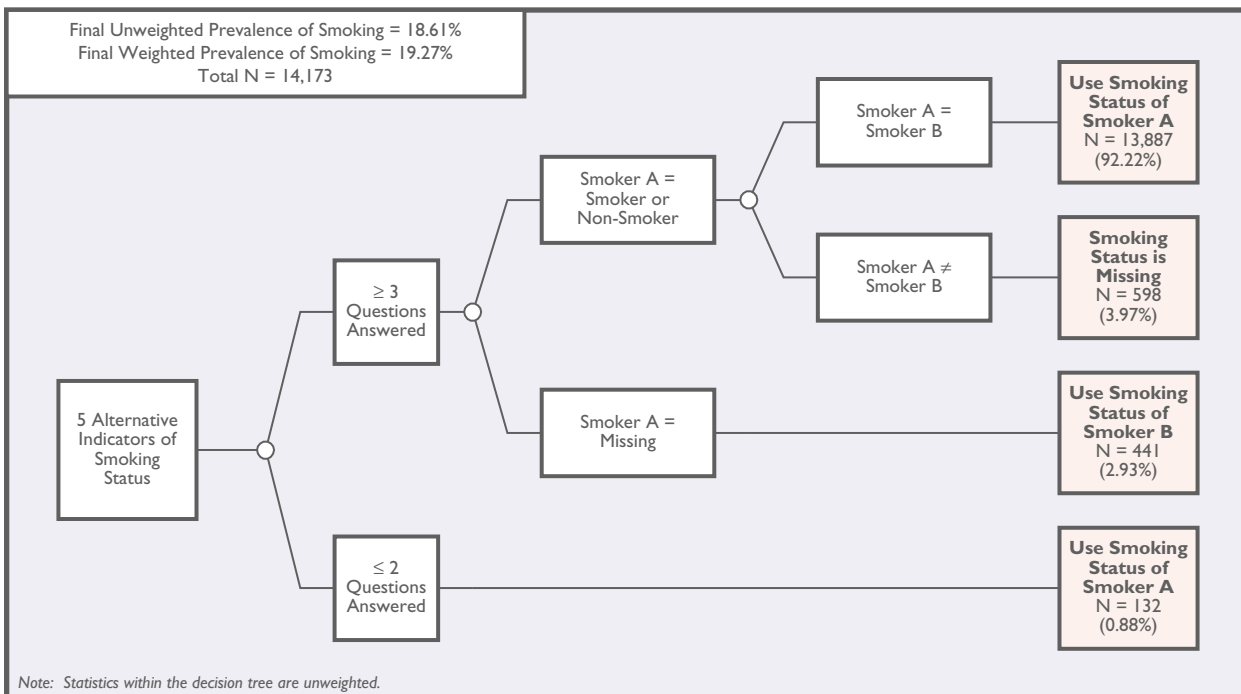


Figure B-3. Decision Tree for Determination of Smoking Status



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