

Tobacco Use among Missouri Middle and High School Students, 2003-2009

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A statistically significant downward trend in current cigarette smoking among both middle and high school students occurred between 2003 and 2009.

Abstract

Reducing tobacco use among young people is an important public health goal. This article summarizes the results of the analysis of Missouri Youth Tobacco Survey (YTS) data collected between 2003 and 2009. The YTS collects information regarding tobacco use and related issues among Missouri public middle and high school students. Downward trends in initiation of tobacco use and current cigarette smoking occurred during this period. However, increased implementation of evidence-based interventions is needed to continue the progress seen during this period.

Introduction

In 2007, 74.4 percent of Missouri adults that smoked reported having first smoked a whole cigarette for the first time before age 18.¹ Preventing the initiation of tobacco use among young people, and helping youth and adults that smoke to quit are two goals the U.S. Centers for Disease Control and Prevention (CDC) established for comprehensive tobacco control programs.² CDC's two other goals are eliminating exposure to secondhand smoke and identifying and eliminating tobacco-related disparities among population groups.

These goals were adopted for the *Missouri Comprehensive Tobacco Prevention and Cessation Program Strategic Plan 2006-2009* and measurable objectives were established for each goal.³ Data are collected and used to track progress in meeting the program goals and objectives over time. This paper highlights key

findings from an analysis of four years of YTS data collected over a period of seven years from 2003 through 2009. The purpose is to communicate trends in tobacco use among Missouri middle and high school students and to offer recommendations for continuing the downward trends seen during this period.

Methods

The Missouri Department of Health and Senior Service (DHSS) conducted the YTS in collaboration with the CDC. A two-stage cluster sample design was used to produce a representative sample of public middle and high school students. In the first sampling stage, schools were randomly selected with a probability proportional to enrollment size. In the second sampling stage, a systematic equal probability sampling (with a random start) was used to select classes from each participating school. All students in sampled classes were eligible to participate. Detailed information on the survey methodology can be found at: http://www.cdc.gov/tobacco/data_statistics/surveys/yts/pdfs/ytsHandbook.pdf.

School and student participation was voluntary, anonymous and confidential. Written survey administration instructions were provided to schools for ensuring student privacy. The Institutional Review Board of the Missouri Department of Health and Senior Services reviewed the YTS protocol and determined it to be exempt.

Survey data were weighted to adjust for student nonresponse and the distribution of students by grade, sex, and race/ethnicity. Statistical analyses were conducted using SAS (SAS Institute Inc.,

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Cary, NC) and SUDANN (RTI International, Research Triangle Park, NC) software to account for the complex sampling design. Differences between prevalence estimates were considered statistically significant if the 95 percent confidence intervals did not overlap. Jointpoint (National Cancer Institute, Bethesda, MD) was used for trend analysis. Trends were considered statistically significant if the p-value of the Average Annual Change (AAC) was < 0.05 .

This paper summarizes results from the survey conducted in 2003, 2005, 2007 and 2009. The overall response rates for the surveys conducted during the four years ranged from 60.1 percent to 72.1 percent for high school and from 62.4 percent to 75.8 percent for middle school. Response rates were sufficient each year to produce prevalence estimates that are representative of all Missouri public middle and high school students in grades six through 12. The full report that includes data charts and annual participation and response rates may be found at <http://www.dhss.mo.gov/data/yts/data.php>.

Results

All Forms of Tobacco Use

From 2003 through 2009, there was a statistically significant downward trend in the percentage of Missouri middle and high school students that ever used any form of tobacco. The AAC for middle school was -2.69 percentage points (p-value = 0.04) and high school was -2.15 percentage points (p-value = 0.02). Forms of tobacco included cigarettes, cigars, smokeless tobacco, pipe, bidis or kreteks. The percentage of middle school students that had ever used any form of tobacco declined significantly from 43.5 percent in 2003 to 25.4 percent in 2009. Among high school students, 65.8 percent had used any form of tobacco in 2003 compared to 51.5 percent in 2009, also a significant decline.

Cigarette Smoking

The percentage of high school students that had ever smoked cigarettes decreased significantly from 61.5 percent in 2003 to 45.7 percent in 2009. Among middle school students, the percentage that had ever smoked cigarettes decreased significantly from 34.0 percent in 2003 to 22.1 percent in 2009.

A statistically significant downward trend in current cigarette smoking among both middle and high school students occurred between 2003 and 2009. The AAC among middle school students was -0.55 percentage points (p-value = 0.01) and high school was -0.91 percentage points (p-value = 0.02). Current smoking for youth is defined as having smoked cigarettes on one or more of the past 30 days. Current smoking prevalence among middle school students in 2003 was 8.8 percent, which declined to 5.7 percent by 2009. The prevalence among high school students in 2003 was 24.3 percent declining to 19.4 percent by 2009. In 2009, current smoking prevalence increased steadily from 1.9 percent of sixth grade students to 28.1 percent of twelfth grade students.

A significantly greater percentage of white high school students were current smokers each year from 2005 through 2009 than were African-American students. In 2009, 21.8 percent of white high school students were current smokers compared to 8.1 percent of African-American students.

A statistically significant downward trend in the percentage of high school students that had ever smoked cigarettes daily occurred between 2003 and 2009. The AAC among high school students was -1.05 percentage points (p-value = 0.01). The percentage of high school students that had smoked daily in 2003 was 20.4 percent declining to 14.3 percent by 2009.

Smokeless Tobacco Use

Smokeless tobacco use increased significantly among high school males from 9.1 percent in 2003 to 16.6 percent in 2009. Among middle school males, smokeless tobacco use remained unchanged from 2003 (4.6 percent) to 2009 (4.7 percent).

Influences to Use Tobacco

Susceptibility to start smoking cigarettes declined significantly among middle school never smokers from 2003 to 2009. In 2003, 23.0 percent of middle school students were susceptible to start smoking compared to 15.5 percent in 2009. Susceptibility to start smoking is calculated from “Definitely yes” and “Probably yes” responses to questions asking if the students think they will try a cigarette soon, if they think they will smoke a cigarette anytime during the next year and would they smoke a cigarette if a friend offered one. These responses indicate the student has not made a firm decision not to smoke cigarettes.

Each year from 2003 through 2009, significantly more middle and high school students that smoked lived with someone that smoked compared to students that had never smoked. In 2009, 69.9 percent of middle school students that smoked lived with someone that smoked compared to 37.8 percent of middle school student that had never smoked. Among high school students in 2009, 58.9 percent of those that smoked lived with someone that smoked compared to 32.8 percent of never smokers.

Also during this period, each year significantly more middle and high school students that smoked had one or more of their four closest friends that smoked compared to students that had never smoked. Each year, approximately 90 percent of middle and high school current smokers had one or more friends that smoked compared to about 30 percent of high school and 15 percent of middle school never smokers.

Each year from 2003 through 2009, significantly more middle school students saw tobacco ads on the Internet than saw or heard anti-tobacco ads. In 2009, 82.8 percent of middle school students saw tobacco ads on the Internet some or most of the time compared to 56.4 percent that saw or heard anti-smoking ads in the past 30 days. Among high school students in 2009, significantly more saw tobacco ads on the Internet (88.0 percent) than saw or heard anti-tobacco ads (69.0 percent).

During the years 2003 through 2009, significantly more middle school and high school students that smoked than students that had never smoked had bought or received anything with a tobacco company name on it, or said they would wear anything with a tobacco company name or picture. Each year, approximately 60 percent of middle and high school students that smoked said they would wear anything with a tobacco company name or picture on it compared to 20 percent or less of never smokers.

Educating About the Danger of Tobacco Use

A majority of middle and high school students had discussed the dangers of tobacco use with a parent or guardian each year from 2003 through 2009. In 2009, significantly more high school students that smoked had discussed the danger of tobacco use with a parent or guardian in the past year (68.7 percent) compared to high school never smokers (56.7 percent). Also in 2009, significantly more middle school students (61.9 percent) than high school students (37.8 percent) had been taught at school that year about the dangers of tobacco use. Less than 20 percent of middle school students (17.3 percent) and high school students (13.4 percent) had participated in any community events discouraging tobacco use in 2009.

Youth Access to Cigarettes

Each year from 2003 through 2009, the most prevalent ways in which high school smokers under the age of 18 obtained their cigarettes was by giving money to someone to buy them or by borrowing them from someone. Significantly fewer high school smokers under age 18 bought their cigarettes from a store in 2009 (9.3 percent) than in 2003 (18.2 percent). Among high school smokers that bought cigarettes in the past 30 days, more than half were not asked to show proof of age or were not refused the purchase because of age each year from 2003 through 2009.

Quitting Tobacco Use

About half of middle school and high school current smokers wanted to quit smoking each year from 2003 through 2009. Approximately 60 percent of middle and high school current smokers had tried to quit smoking in the past year each year from 2003 through 2009. Each year, about 40 percent of middle and high school current smokers stayed off cigarettes less than 30 days on their last quit attempt.

Fifteen percent or less of middle school smokers and ten percent or less of high school smokers participated in a program to help them quit each year 2003 through 2009.

The majority of middle and high school students that smoke think they would be able to quit now if they wanted to. Significantly more middle school students that smoke thought they could quit in 2009 (82.1 percent) than in 2003 (61.8 percent). In 2009, more than a quarter of middle and high school smokers thought it is safe to smoke a year or two as long as you quit after that.

The percentage of high school students asked by a doctor or other health professional if they smoked decreased significantly from 37.5 percent in 2007 to 28.9 percent in 2009. A third (33.6 percent) of high school students were advised not to smoke by a doctor or other health care professional in 2009. In 2009, 12.1 percent of middle school students were asked if they smoked by a doctor and 23.8 percent of students were advised not to smoke.

Secondhand Smoke Exposure and Beliefs

Each year from 2003 through 2009, significantly more middle and high school students that smoked than those that had never smoked were in a room with someone else that smoked on one or more of the past seven days. The percentage of middle school never smokers in a room with someone that smoked on one or more of the past seven days decreased significantly from 53.7 percent in 2003 to 44.2 percent in 2009. Among high school never smokers, 52.6 percent were in a room with someone that smoked on one or more of the past seven days in 2003 compared to 49.0 percent in 2009, not a significant decrease.

In 2009, 68.7 percent of middle school students and 69.1 percent of high school students lived in a home where smoking is never allowed. Also in 2009, 84.2 percent of middle school students and 79.0 percent of high school students thought smoking should never be allowed in homes.

Approximately one-third of middle and high school students that had never smoked rode in a car with someone that smoked on one or more of the past seven days each year 2003 through 2009. In 2009, 65.8 percent of middle school students and 58.4 percent of high school students rode in or drove a vehicle most in which smoking is never allowed. In 2009, significantly more middle school students (83.7 percent) than high school students (70.6 percent) thought smoking should never be allowed in vehicles.

Each year 2003 through 2009, more than 90 percent of middle and high school never smokers and more than 80 percent of middle and high school current smokers said they “Definitely think” or “Probably think” other people’s cigarette smoke is harmful to them.

In 2007 and 2009, more than 20 percent of high school students worked in places that allow smoking. In 2009, 14.5 percent of high school students were exposed to cigarette smoke at work in the past seven days. Significantly more middle and high school students thought smoking should never be allowed in indoor areas where people work in 2009 than in 2007 - 87.3 percent of middle school and 73.9 percent of high school students in 2009 compared to 82.4 percent of middle school and 68.1 percent of high school students in 2007.

Discussion and Recommendations

Encouraging results from the Missouri Youth Tobacco Survey reveal that tobacco use initiation and current cigarette

smoking among middle and high school students are trending downward. Middle and high school students also overwhelmingly identified secondhand smoke as harmful, and strongly supported smoking not being allowed in homes, vehicles, and work places. These results may be due at least in part to the increase in programs initiated during this period that involved youth advocating for tobacco-free communities.⁴

However, of concern is that each year during the period, over 40 percent of middle and high school students that had never smoked were exposed to secondhand smoke in the past seven days. Also of concern are an increase in the use of smokeless tobacco among high school males and the low percentage of middle and high school smokers that participated in a program to help them quit. Additionally, significant disparities existed between students that currently smoke and those that have never smoked with regard to influences to use tobacco.

Among the influences to use tobacco is living with someone that smokes. Almost twice as many middle and high school students that currently smoke live with someone that smokes than students that have never smoked. To reduce youth smoking, increased efforts to reduce adult smoking must also be made. At 23.1 percent, Missouri's adult smoking prevalence was among the highest of all states in 2009.⁵ Health care provider counseling and affordable cessation services, both evidence-based interventions,⁶ should be made widely available for adults and young people that want to quit. The YTS showed that less than 15 percent of middle and high school students that smoked had participated in a program to help them quit even though half of the students said they wanted to quit and more than half had tried to quit in the past year.

Raising the price of tobacco products is also an effective strategy for reducing tobacco use among both adults⁷ and youth.⁸ Missouri's state excise tax on a package of cigarettes is 17 cents, the lowest in the country.⁹ The YTS revealed that the most prevalent way in which high school smokers under the age of 18 obtain their cigarettes is to give money to someone else to buy them. By making cigarettes less affordable, fewer youth will be able to pay for them. Raising the tax could also provide funding to support a comprehensive tobacco prevention and cessation program for Missouri.

An additional influence for youth to use tobacco is advertising by tobacco companies. While the percentage of students that saw tobacco advertising on the Internet remained consistently high at more than 80 percent over the period of 2003 through 2009, the percentage that saw or heard anti-smoking ads declined significantly. Anti-smoking advertising in combination with other interventions has been shown to be associated with significant declines in youth smoking¹⁰ and should be increased to counter tobacco industry advertising.

Prohibiting smoking in public places is an important strategy for reducing exposure to secondhand smoke and has also been linked to reduced youth smoking initiation.¹¹ The YTS

showed that about one quarter of high school students that work do so in places that allow smoking. State and local laws should be strengthened to not allow smoking in all indoor work places, including restaurants. By prohibiting smoking in all work and public places, exposure to secondhand smoke will be reduced and youth will see less smoking modeled by adults.

Summary

Tobacco use among Missouri middle and high school students declined from 2003 through 2009. Efforts to implement strategies that have been clearly shown to reduce tobacco use among youth and adults must be expanded so the downward trends seen during this period continue.

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Disclosure

None reported.