

Teens and Tobacco in Minnesota: Highlights from the 2020 Youth Tobacco Survey

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We express our thanks to the thousands of students who completed the Minnesota Youth Tobacco Survey in 2020 and in previous years for their willingness to answer questions about their experiences with commercial tobacco. We are equally indebted to the principals, teachers, and staff who worked to make sure the survey went smoothly at schools around the state. ICF Macro, Inc. and its team of local survey administrators made all the arrangements with schools and administered the survey in the selected classrooms. In addition, ICF Macro, Inc. drew the school samples, programmed the online survey, and prepared the initial data file, including sample weights.

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Finally, we thank the many dedicated people throughout the state who support the well-being of our young people by encouraging them to reject commercial tobacco use. We hope this information will help everyone better understand the trends and characteristics of teen tobacco use in Minnesota.

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Executive Summary

New data from the 2020 Minnesota Youth Tobacco Survey (MYTS) reveal that middle school and high school students' current use of e-cigarettes (vaping) remains high, while use of cigarettes, cigars, smokeless, and other commercial tobacco products continues to decline.

In 2020, about one in five high school students had vaped in the past 30 days, a proportion essentially unchanged from three years earlier. However, students are now vaping more frequently than they had been previously, which can be a sign of dependence. A third of students who vape used an e-cigarette on at least 20 of the past 30 days, an 80% increase of frequent vaping since 2017. The majority of students who use e-cigarettes report strong cravings and other signs of nicotine dependence, such as reaching for their e-cigarette without thinking about it. Over half of students who vape want to quit, and nearly two-thirds have already tried to quit, with some having tried to quit as many as 10 or more times without success. Slightly more than half of students would like assistance to quit, especially in-person coaching and nicotine replacement patches or gum.

The tobacco industry has for decades added flavors to tobacco to make their products more enticing and palatable to new users. In 2020, 78% of Minnesota students who experimented with tobacco reported that the first product they ever tried was flavored with menthol or another flavor. Flavors continue to appeal to youth, and the tobacco industry's continued practice of flavoring tobacco products effectively attracted Minnesota students to use them: in 2020, nearly 80% of students who currently use tobacco reported having used a flavored tobacco product in the past 30 days. Students who use e-cigarettes are more likely than students who use other tobacco products to report using flavored products.

In contrast with their use of e-cigarettes, Minnesota teens are overwhelmingly rejecting cigarettes, cigars, and smokeless tobacco. The prevalence of current use of these products plummeted in 2020. In addition, polytobacco use (use of more than one type of tobacco product) dropped dramatically. In 2020, current use of cigarettes among high school students was 3.2%, a 67% decrease from 2017 and a 90% decrease from 2000, the year the first MYTS was fielded. Current cigar use among high school students (3.3%) and smokeless tobacco use (1.3%) also considerably declined from 2017.

Finally, data from the 2020 MYTS show us that repeated exposure to secondhand smoke remains a serious health threat for one in five Minnesota students. These students are at increased risk for developing asthma and other health problems. More than one in four students had been exposed to secondhand e-cigarette aerosol, a small but statistically significant increase from 2017. The long-term health risks from exposure to secondhand e-cigarette aerosol are unknown, but many of the elements identified in e-cigarette aerosol are known to cause respiratory distress and disease.

Introduction

Since 2000, the Minnesota Department of Health (MDH) has conducted the Minnesota Youth Tobacco Survey (MYTS) to provide comprehensive information needed to understand commercial tobacco use among young people and to design and evaluate prevention efforts. MDH conducted the eighth MYTS in 2020. Previous surveys took place in 2000, 2002, 2005, 2008, 2011, 2014, and 2017.

The Minnesota Youth Tobacco Survey measures use of eight types of commercial tobacco products and includes additional questions related to use of cigarettes and electronic cigarettes (also known as e-cigarettes or vapes). The survey also measures exposure to tobacco advertising, secondhand smoke, secondhand e-cigarette aerosol, and other topics. For each survey administration, 100 public middle and high schools across the state are selected at random and invited to participate. Typically, about 70 schools participate in the study, and more than 4,000 students in grades 6-12 provide responses, generating overall response rates exceeding 60%. The data are weighted to better represent statewide demographics. The 2020 survey was atypical, however, as described in the next section.

This report presents highlights from the 2020 survey results, and where possible, changes over time since 2000. All references to tobacco use in this document refer to use of commercial tobacco products only and not use of traditional tobacco for sacred purposes.¹

2020 MYTS Nonresponse

The data collection period for the 2020 MYTS ended early when Minnesota schools adapted to the coronavirus pandemic by switching to distance learning. At that time, 34 schools and 2,184 students had participated in the survey, yielding an overall response rate of 29.4%. This lower response rate could indicate greater nonresponse bias, meaning greater risk that the respondents do not represent the overall student population.

To examine this possibility, we compared the characteristics of responding and nonresponding schools and their students. Among the seven school-level variables examined, only metropolitan status was found to have a significant relationship with school-level response; schools located in the seven-county metropolitan area had a lower response rate (20.8%) compared to schools located in greater Minnesota (46.8%). Among the nine student-level variables examined, only an indicator related to poverty was significantly associated with participation in the survey; schools with a larger proportion of students whose household income is below the poverty line had a significantly lower response rate (6.7%) compared to schools with fewer students living below the poverty line (37.6%)

To account for the potential bias associated with the systematic difference in response by metropolitan indicator, we used metropolitan status to adjust for school nonresponse. While the poverty indicator variable was found to have a significant relationship with school nonresponse, we did not adjust the school-level weights to account for this relationship. Given that only one school responded among the 15 schools sampled with large proportions of students below poverty, the adjustment factor would have been very large, increasing the standard errors of the estimates.

We were concerned that the schools that participated earlier in the data collection window (and before data collection prematurely ended) may have more resources, better organization, or fewer demands, and those advantages could be associated with lower tobacco use rates

among their students. If this were the case, the tobacco use prevalence estimates calculated from the schools included in the 2020 MYTS may underestimate statewide student tobacco use prevalence. To examine this hypothesis, we leveraged the 2017 MYTS data to compare the tobacco use rates of schools that had completed the 2017 MYTS earlier in the data collection period to those that had completed it later and found a slight trend in the opposite direction, where earlier responding schools had *higher* rates of tobacco use among their students than later responding schools. This finding does not support the hypothesis that early termination of the data collection period in 2020 deflated tobacco use prevalence estimates.

In addition, we compared 2020 MYTS responding and nonresponding schools' 2019 tobacco use prevalence rates using data from the Minnesota Student Survey and found no significant differences: schools with higher tobacco use prevalence in 2019 were no more (or less) likely to have provided data for the 2020 MYTS than were schools with lower tobacco use prevalence.

We conclude that the 2020 MYTS data are sufficiently reliable to share with the public and use for decision-making but ask the reader to interpret these data with more caution than with previous MYTS administrations.

Commercial Tobacco Initiation and Current Use

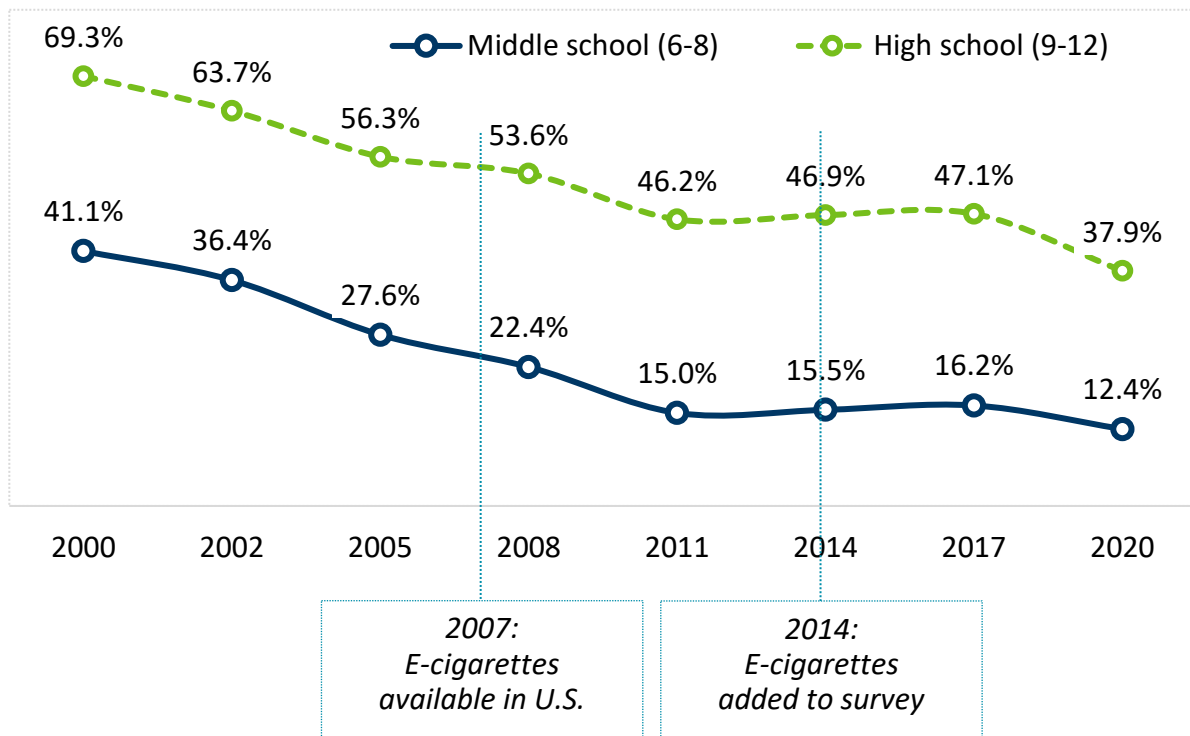
Initiation

Commercial tobacco products deliver nicotine to the user, and nicotine is highly addictive. The younger people are when they start using tobacco, the more difficult it is for them to quit. For decades, cigarettes were the path to harmful nicotine addiction. Nearly 90% of cigarette smokers first tried smoking by age 18, and 99% first tried smoking by age 26.² Each day in the United States, more than 3,200 youth aged 18 years or younger smoke their first cigarette.²

E-cigarettes have now surpassed cigarettes as the most commonly used commercial tobacco product among young people. E-cigarettes are battery-powered devices that allow users to inhale, or vape, aerosolized liquid (e-juice). At the national level, in 2019, 35.0% of middle school and high school students reported having ever tried an e-cigarette; in comparison, 16.4% reported having ever tried a conventional cigarette.³

Trying or experimenting with tobacco is a first step that may eventually lead to regular use. Public health organizations and schools are working to reduce the number of youth who take this initial step.

Figure 1. Percent of students who have ever tried a commercial tobacco product, 2000-2020.



Source: Minnesota Youth Tobacco Survey, 2000-2020.

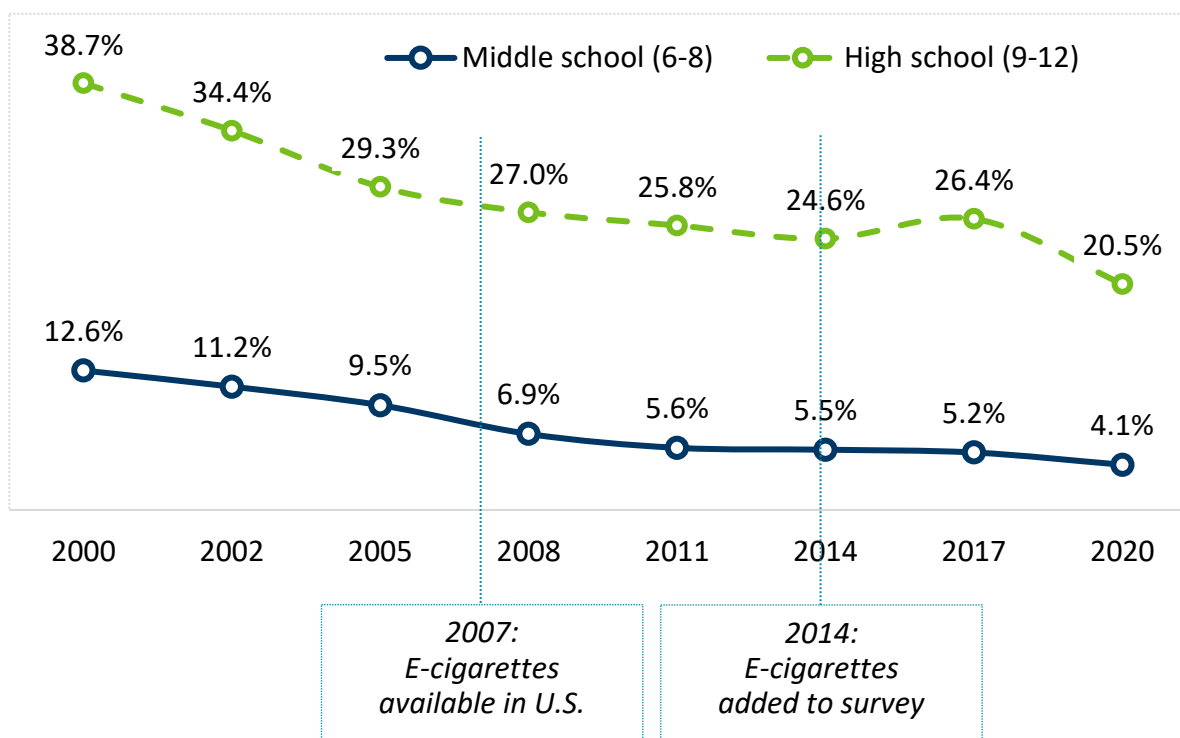
* Questions about snus and hookah were also added to the 2014 survey.

In 2020, 37.9% of high school and 12.4% of middle school students in Minnesota had tried at least one commercial tobacco product in their lifetimes (Figure 1). These percentages are significantly lower than they were in 2017. These declines are consistent across tobacco product types; compared to 2017, a smaller share of students in 2020 had ever tried e-cigarettes, cigarettes, cigars, smokeless tobacco, hookah, pipe, snus, or bidis.

Current Use

Current use of tobacco is defined as having used tobacco products on one or more days in the past 30 days. Current use is an important measure of the commercial tobacco threat because it reflects how many youth have not only tried tobacco but also used it recently, which may indicate more regular use. The Centers for Disease Control and Prevention (CDC) reported that 23.6% of high school and 6.7% of middle school students nationally were current tobacco users in 2020.⁴

Figure 2. Percent of students who used a commercial tobacco product in the past 30 days: 2000-2017.



Source: Minnesota Youth Tobacco Survey, 2000-2020.

* Questions about e-cigarettes, hookah, and snus were added to the MYTS for the first time in 2014.

In 2020, 20.5% of Minnesota high school and 4.1% of middle school students had used one or more tobacco products in the past 30 days (Figure 2), a statistically significant decrease from 2017 among high school students. These prevalence rates indicate that an estimated 65,050 students in grades 6 through 12 used a tobacco product in the past 30 days, 12,740 fewer than in 2017.

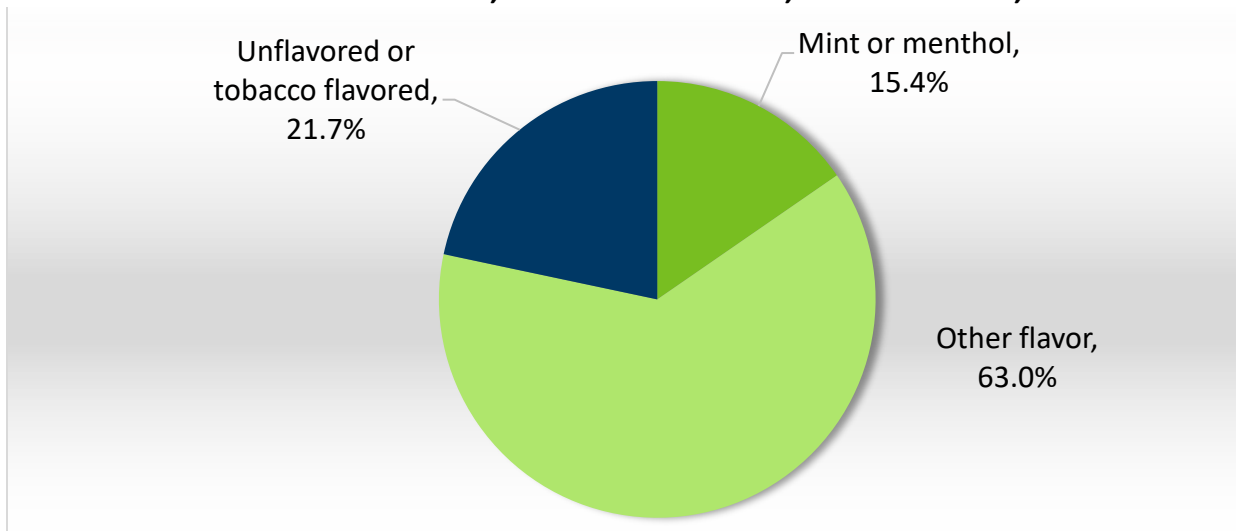
Use of Flavored Tobacco Products

Menthol is an ingredient derived from peppermint or other mint oils that the tobacco industry has added to cigarettes and other tobacco products for decades. Menthol makes smoking easier by masking the harshness and irritation that people, especially new users or younger people, may feel when they inhale cigarette smoke. Youth who experiment with menthol cigarettes are more likely to transition to regular smoking than those who start with non-menthol cigarettes.⁵

The tobacco industry has a long history of adding flavors to tobacco products that particularly appeal to children and young adults. Tobacco companies were legally prohibited from adding flavors to cigarettes in 2009, but they were allowed to continue selling menthol cigarettes, and they continue to flavor cigars, e-cigarettes, and other tobacco products with kid-friendly flavors such as “gummi bear”⁶ and “banana smash”⁷ to hook a new generation of tobacco users. More than 80 percent of teenagers reported their first tobacco product was flavored,⁸ and the majority of a random sample of California teens and young adults felt advertisements for flavored e-liquids were aimed at people their age or younger.⁹ Many cities have restricted sales

of menthol and other flavored tobacco to make it more difficult for young people to get these products.

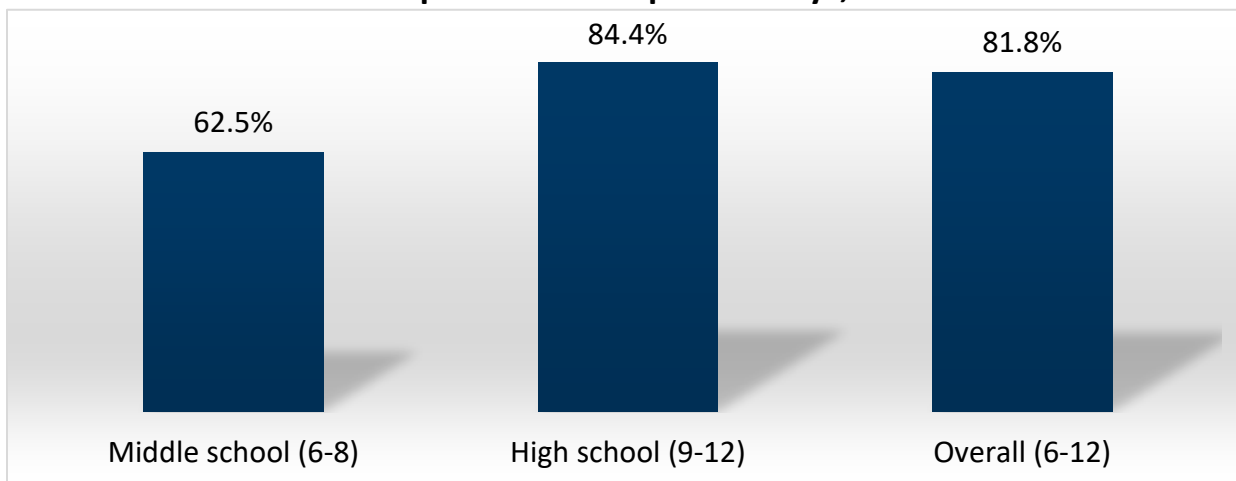
Figure 3. Percent of students who reported that the first tobacco product they ever tried was mint or menthol, some other flavor, or unflavored, 2020.



Source: Minnesota Youth Tobacco Survey, 2020.

Consistent with previous studies, about four in five Minnesota students (78.4%) reported that the first tobacco product they ever tried was flavored (Figure 3), suggesting that flavors increase the appeal of tobacco products for young people.

Figure 4. Percent of students who currently use commercial tobacco who used a menthol or other flavored product in the past 30 days, 2020.



Source: Minnesota Youth Tobacco Survey, 2020; note: comparable data for 2017 were not available.

In 2020, four in five students who currently use commercial tobacco (81.8%) reported using a menthol or other flavored product during the past 30 days (Figure 4). Of the tobacco products students use, e-cigarettes are the most likely to be flavored. Nearly nine in ten students who currently use e-cigarettes (87.1%) reported using a flavored e-cigarette in the past 30 days. In contrast, 26.1% of cigar users reported using a flavored version of that product in the past 30 days.

Menthol cigarettes continue to be a problem for youth in Minnesota. In 2020, 32.8% of students currently smoked menthol cigarettes, statistically unchanged from 2017 (34.1%). This is higher than the share of Minnesota adults who smoke and whose usual brand is menthol (27.5% in 2018).¹⁰

In Minnesota, more than 15 communities have passed flavored tobacco restrictions, including major cities and small towns. Some have restricted sales of flavored tobacco products including menthol tobacco products, and others have limited flavored tobacco product sales to adult-only locations. Reducing the availability of menthol and other flavored tobacco is an effective strategy to prevent youth initiation and use.

Current Use of E-Cigarettes and Other Product Types

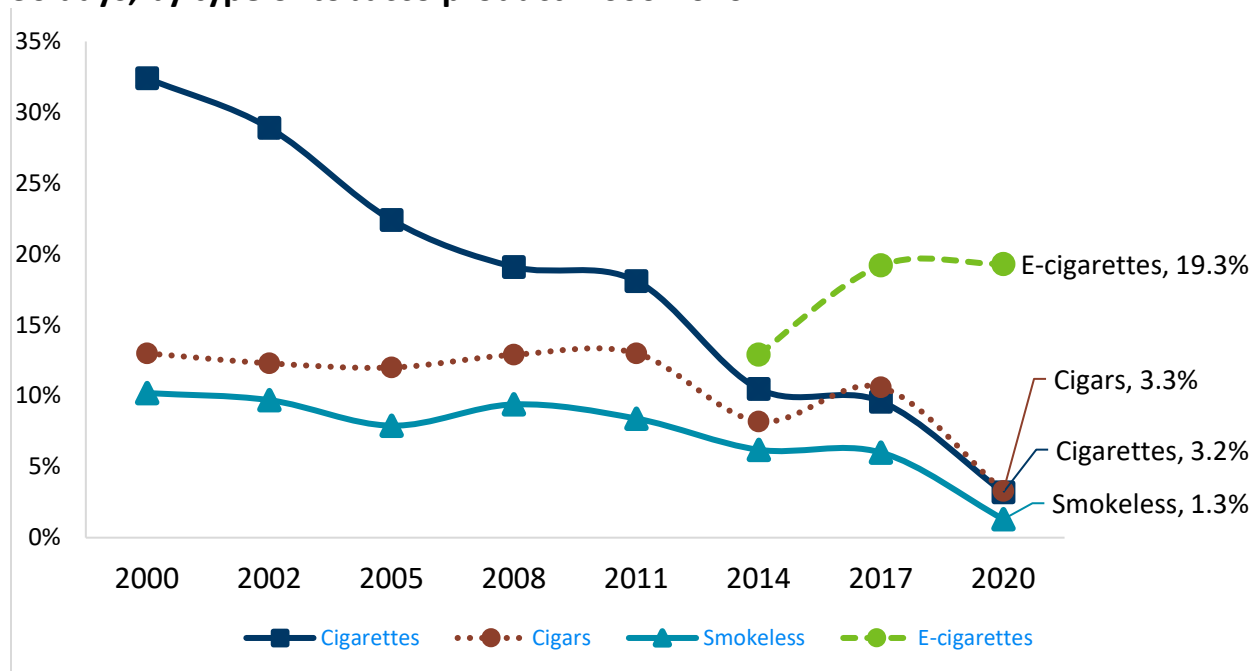
Commercial Tobacco Use by Product Type

Tobacco policy and tobacco control efforts affect tobacco use. The tobacco industry continually adapts to market conditions by changing promotional tactics, modifying existing products, and introducing new ones. As a result, the mix of commercial tobacco products used by students is changing. Cigarettes no longer dominate the tobacco market among youth.

E-cigarettes were introduced to the U.S. in 2007 and marketed as an alternative to smoking cigarettes. E-cigarettes are battery-powered devices that allow users to inhale, or “vape,” aerosolized liquid (e-juice). Most e-liquids contain nicotine.¹¹ The tobacco industry designed these products with sleek designs and appealing flavors, resulting in adolescents using them in alarming numbers.

E-cigarettes are not safe for youth. Nicotine is highly addictive and can harm the developing adolescent brain. Because the brain is still developing until about age 25, youth and young adult exposure to nicotine can lead to addiction and disrupt attention and learning. No amount of nicotine is safe for youth.¹²

Figure 5. Percent of high school students who used a tobacco product in the past 30 days, by type of tobacco product: 2000-2020.



Source: Minnesota Youth Tobacco Survey, 2000-2020.

* Questions about e-cigarettes were added to the MYTS for the first time in 2014.

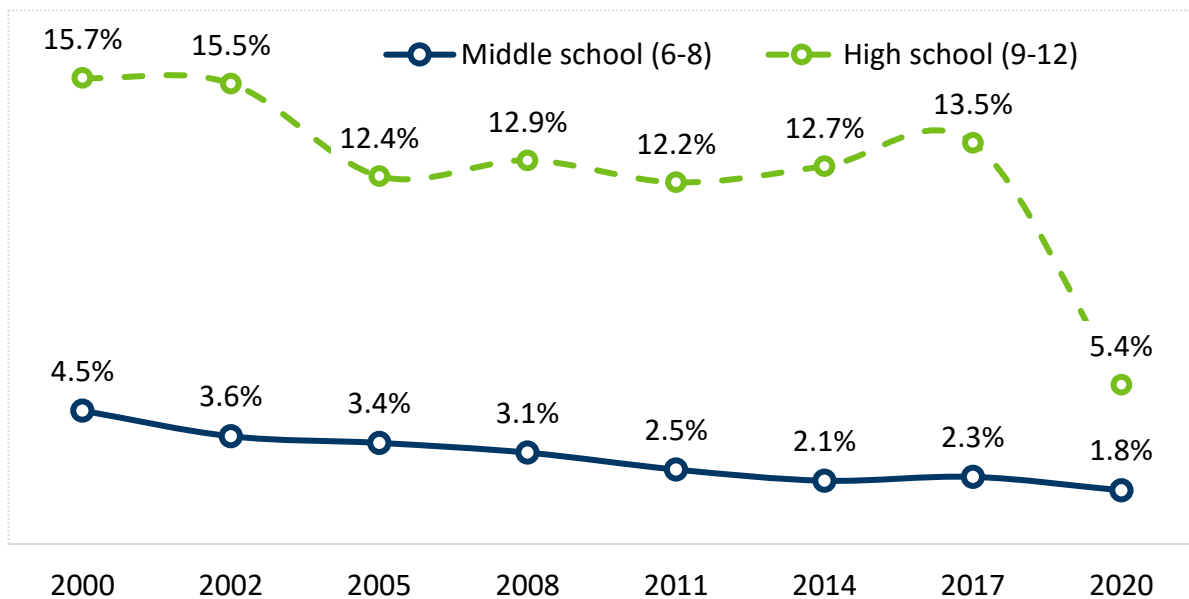
The 2020 MYTS data show that while students' use of many commercial tobacco products continued to decline, use of e-cigarettes remained high; 19.3% of high school students and 2.9% of middle school students used e-cigarettes in the past 30 days (Figure 5), statistically unchanged from 19.2% and 3.3%, respectively, in 2017. The percentage of students who reported having ever tried e-cigarettes also remained high and statistically unchanged from 2017: 35.4% of high school students and 7.9% of middle school students in 2020 reported using an e-cigarette at least once, compared with 37.7 and 9.9%, respectively, in 2017.

In contrast with the stubbornly high prevalence of e-cigarette use, current smoking rates among students dropped markedly: 3.2% of high school students smoked cigarettes, a 67% decline from 2017 and a 90% decline from 2000, the year the first MYTS was fielded. Similarly, 3.3% of high school students smoked cigars in the past 30 days, down from 10.6% in 2017. Current use of smokeless tobacco fell from 6.0% in 2017 to 1.3% in 2020. These reductions are statistically significant. Middle school students' current use of cigarettes (2.0%), cigars (1.1%), and smokeless tobacco (0.9%) remain statistically unchanged from 2017.

Use of Multiple Types of Commercial Tobacco Products

The CDC reports that youth who use two or more types of tobacco products (called polytobacco use) are at higher risk for developing nicotine dependence than those who use one type and may be more likely to continue using tobacco into adulthood.¹³

Figure 6. Percent of students who used two or more types of commercial tobacco product in the past 30 days: 2000-2020.



Source: Minnesota Youth Tobacco Survey, 2000-2020.

* Questions about e-cigarettes, hookah, and snus were added to the MYTS for the first time in 2014.

From 2000 to 2017, between 12% and 16% of Minnesota high school students reported having used two or more types of tobacco in the past 30 days. However, in 2020 this percentage declined to 5.4% (Figure 6). Nationally, this statistic dropped from 9.2% in 2017¹⁴ to 8.2% in 2020.¹⁵

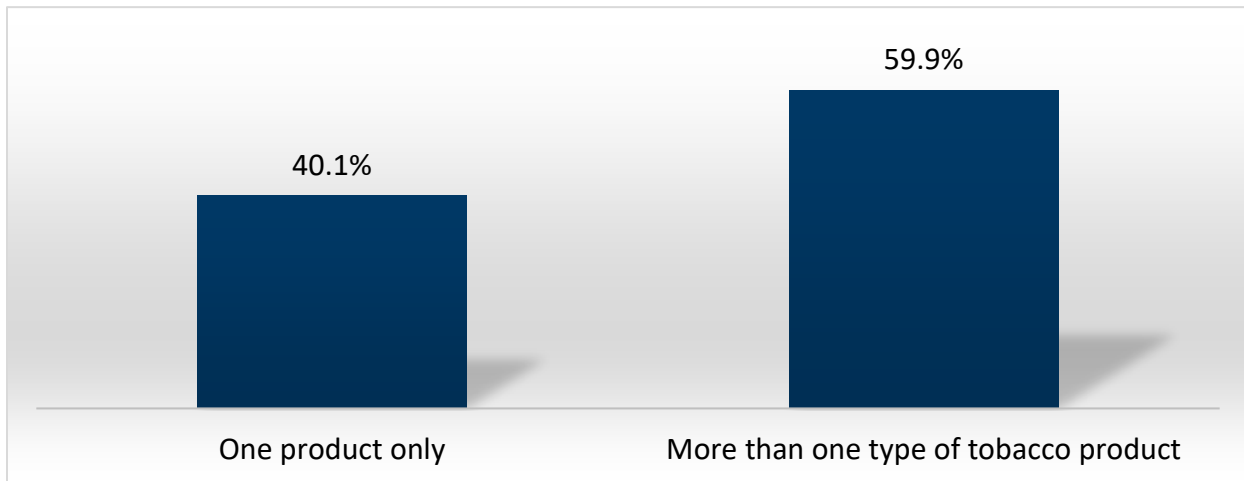
In 2020, the most common combination of products used by Minnesota students who used more than one product type in the past 30 days was e-cigarettes and cigarettes (28.3%). The second most common combination was e-cigarettes and cigars (19.9%), and the third most common combination was the use of cigarettes, cigars, and e-cigarettes (10.2%).

Nicotine Dependence

Nicotine is highly addictive. Adolescents and young adults are particularly susceptible to addiction, because their brains are still developing. The 2020 MYTS included new measures of dependence on nicotine and e-cigarettes.

One sign of nicotine dependence is frequent use, defined as use on 20 or more of the past 30 days. In 2020, 33.6% of students who currently use e-cigarettes frequently used the product, an 80 percent increase from 2017 (18.7%). In contrast, the percent of students who frequently smoke cigarettes declined 47 percent from 28.8% in 2017 to 15.2% in 2020.

Figure 7. Percent of students who currently use tobacco who reported having recently experienced a strong craving for tobacco, by number of products used in the past 30 days.

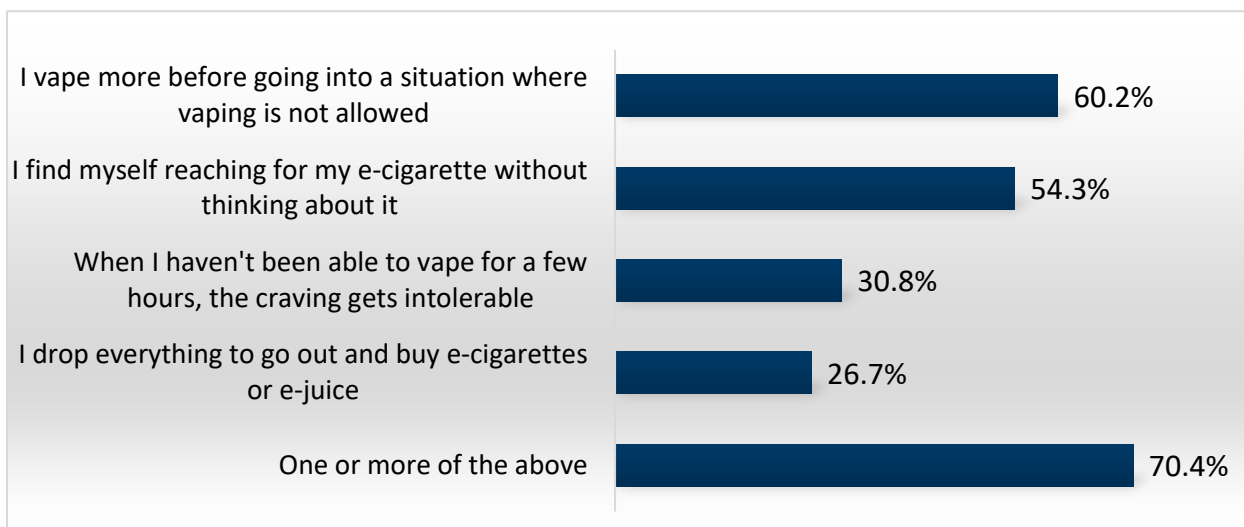


Source: Minnesota Youth Tobacco Survey, 2020.

The 2020 MYTS asked students whether they had experienced a strong craving or feeling like they really needed to use a tobacco product in the past 30 days. Among students who had used a tobacco product in the past 30 days, 42.8% reported having experienced a strong craving. Polytobacco use was strongly associated with cravings, which is a sign of nicotine dependence. Three in five students who had used more than one type of tobacco in the past 30 days (59.9%) reported they had felt a strong craving (Figure 7), compared with two in five students who had used only e-cigarettes or another tobacco product in the past 30 days (40.1%).

The 2020 MYTS included for the first time a four-item e-cigarette dependence scale. The scale asked how often students who use e-cigarettes experience signs of dependence. A response of at least “rarely” on one or more of the four items is considered a sign of dependence.

Figure 8. Percent of students who currently use e-cigarettes and reported having experienced a sign of dependence.



Source: Minnesota Youth Tobacco Survey, 2020. Note: students are in the numerator if they reported experiencing the symptom rarely or more often.

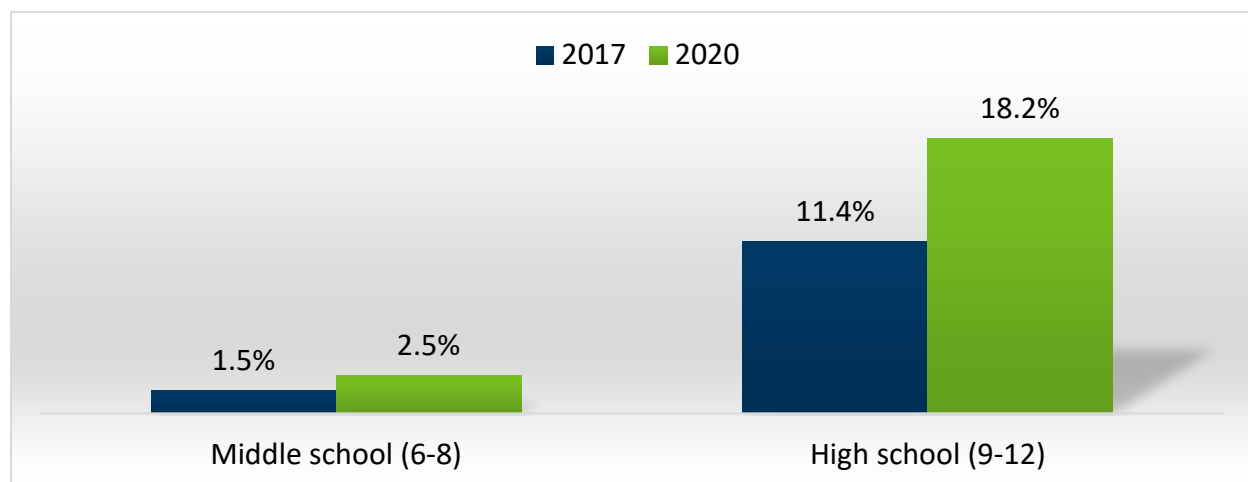
The most commonly reported sign of dependence was vaping more before going into situations where vaping is not allowed: 60.2% of middle school and high school students reported having experienced this sign (Figure 8). Overall, 70.4% of students who used e-cigarettes in the past 30 days reported one or more signs of e-cigarette dependence (69.7% of high school and 78.0% of middle school students who currently use e-cigarettes).

E-cigarettes and Recreational Marijuana

Vaping devices can be used to vaporize marijuana or THC oil or wax (THC is the primary psychoactive ingredient in marijuana). “Vaping” marijuana for recreational use may appeal to youth because it produces less odor than smoking marijuana through a joint, blunt (a hollowed-out cigar filled with marijuana), or pipe. THC concentrations in vaporized hash oil or wax can be considerably higher and therefore more potent than smoking or eating marijuana.

Cigarette smoking has had a well-established association with later marijuana use. Studies are beginning to show that early use of e-cigarettes and other tobacco products¹⁶⁻¹⁸ also increases risk for marijuana initiation. The 2017 and 2020 MYTS questionnaires asked students whether they had ever used an e-cigarette device with marijuana, THC or hash oil, or THC wax.

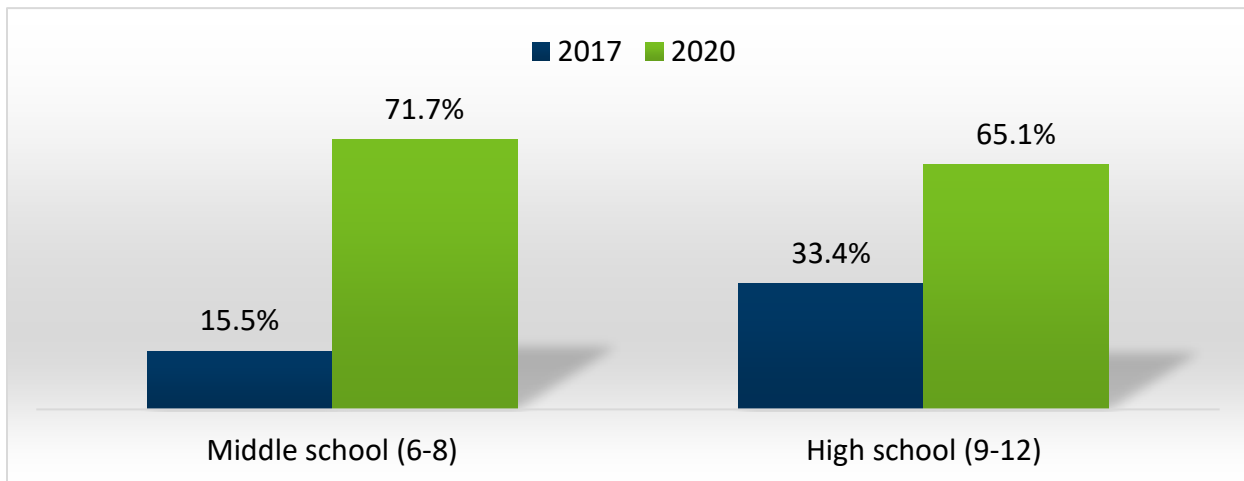
Figure 9. Percent of middle school and high school students who have ever used an e-cigarette device to vape marijuana/THC.



Source: Minnesota Youth Tobacco Survey, 2017, 2020.

The percent of high school students who reported using e-cigarettes to vape marijuana increased by 60 percent since 2017. In 2017, more than one in ten high school students (11.4%) reported they had ever (at least once in their lifetimes) used an e-cigarette device to vaporize marijuana, THC or hash oil, or THC wax. In 2020, this percentage increased to 18.2 percent (Figure 9). The percent of middle school students who reported using e-cigarettes to vape marijuana also increased, but the change was only marginally statistically significant ($p < .06$).

Figure 10. Percent of current e-cigarette users who have ever used an e-cigarette device to vape marijuana/THC.



Source: Minnesota Youth Tobacco Survey, 2017-2020.

Nearly two-thirds of high school students who currently use e-cigarettes (65.1%) reported having ever vaped marijuana, which is nearly double the percentage from 2017 (Figure 10). In 2020, the percentage of middle school students who use e-cigarettes who reported having ever vaped marijuana (71.7%) more than tripled from 2017. While this is a large increase, it is important to note that middle school students who vape marijuana is a small percentage (2.5%) of the middle school population.

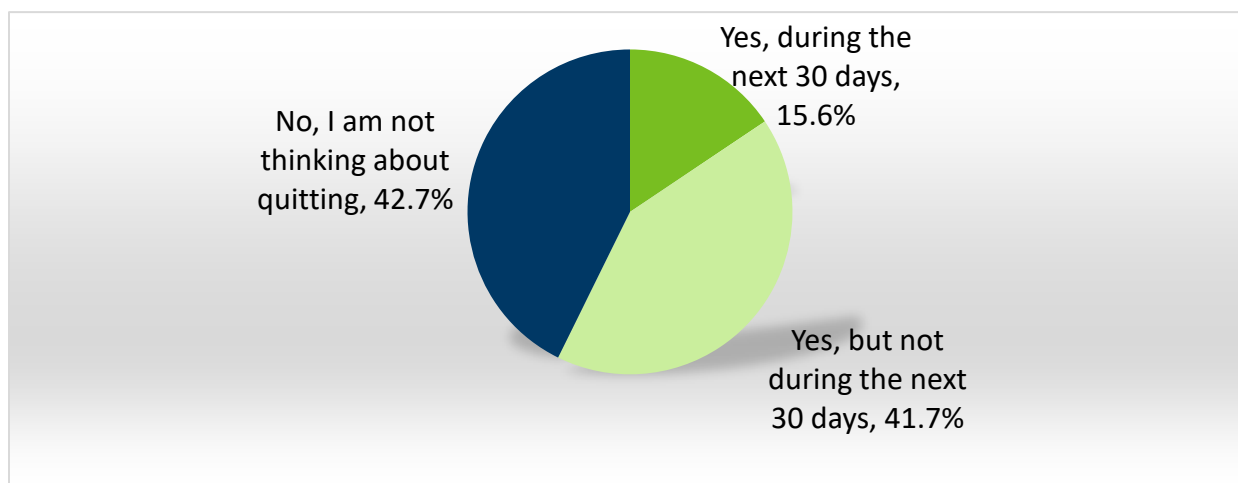
Quitting Commercial Tobacco

According to its website, in 1998 the Youth Tobacco Cessation Collaborative (YTCC) was established to help youth quit tobacco by ensuring that every young person who uses tobacco has access to cessation interventions that work for them.¹⁹ The YTCC identified research goals related to youth cessation, for example examining how intermediate quitting behaviors, such as quit intentions and attempts, relate to youth quit attempts and success. Healthy People 2020 included an objective focused on increasing youth tobacco cessation attempts. The Public Health Service recommends health care providers ask adolescent patients about their use of tobacco and provide counseling interventions to aid them in cessation.²⁰

Intentions to Quit

Studies show that intending to quit tobacco is a strong predictor of future quit attempts and quit success.²¹ Tworek and her colleagues analyzed the 2012 National Youth Tobacco Survey data and found that 52.8% of youth who currently use tobacco intended to quit using all tobacco products.²² The study also showed that students who used a single type of tobacco product were more likely than students who used multiple tobacco types to intend to quit. Students who smoked cigarettes had the highest prevalence of intentions to quit (56.8%), followed by students who used e-cigarettes (50.9%), cigars (48.4%), pipe (47.2%), or smokeless tobacco (44.9%).

Figure 11. Intention to quit among students who reported having used a tobacco product in the past 30 days.



Source: Minnesota Youth Tobacco Survey, 2020. Note: this chart excludes students who had used a product within the past 30 days but reported they had “already quit” using all tobacco.

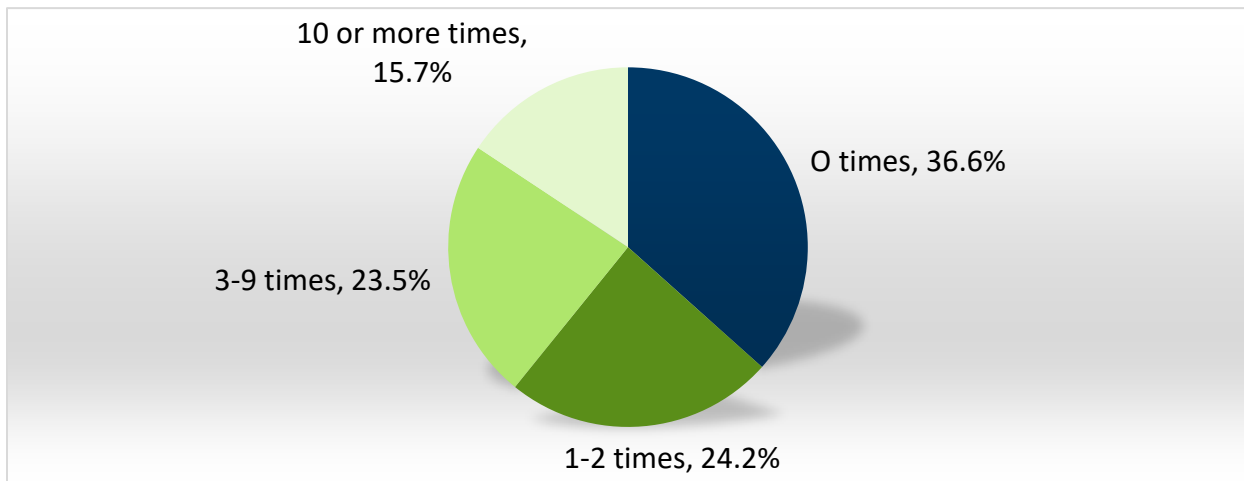
In 2020, 42.7% of Minnesota students who had used a tobacco product in the past 30 days had no intentions to quit, while 57.3% intended to quit using all tobacco products within the next 30 days or later (Figure 11).

Quit Attempts

Studies on youth smoking cessation suggest that social and environmental factors affect youth quitting. For example, perceptions that tobacco use is unacceptable, smoking restrictions, and household bans can increase cessation. Studies also suggest that young adults who recognize the negative health effects, have access to and make use of cessation resources, have tried to quit before, and have lower addiction levels tend to be more successful at quitting for good.

While less is known about adolescent e-cigarette cessation, health organizations and state governments are building on what works for conventional tobacco cessation to develop and offer e-cigarette cessation programs and resources specifically for teens to meet their unique needs.^{23, 24} In April 2020, after data were collected for the 2020 MYTS, MDH launched the state’s first free youth cessation program, My Life, My Quit, a free service for teens to access help online and quit coaching by texting, chat, or phone.²⁵

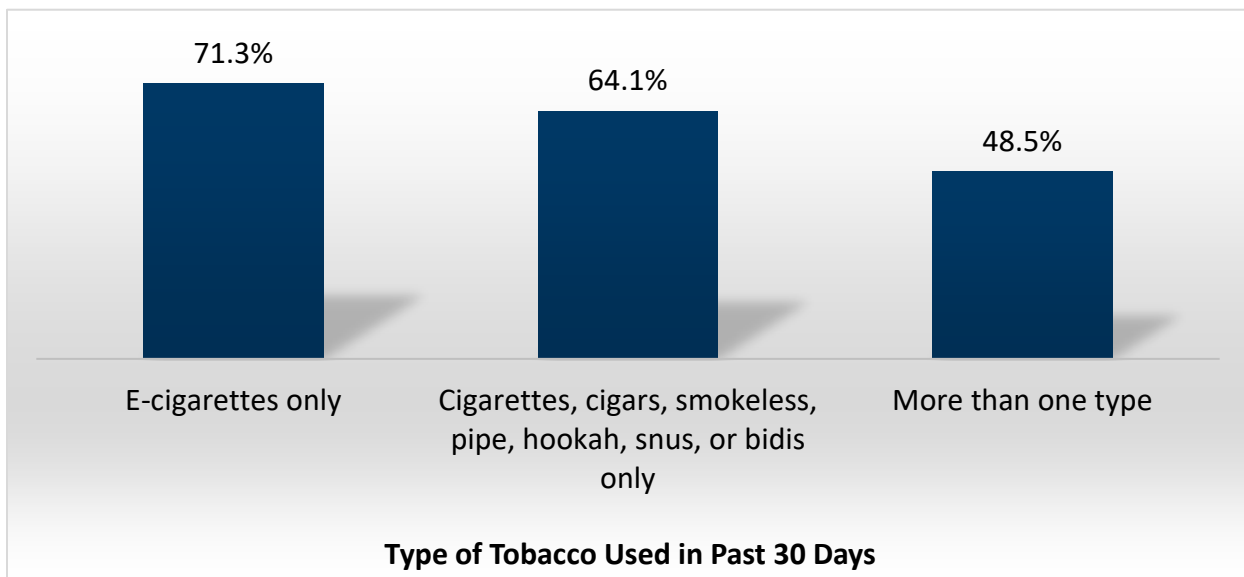
Figure 12. Number of quit attempts within the past 12 months among students who reported having used a tobacco product within the past 30 days, 2020.



Source: Minnesota Youth Tobacco Survey, 2020.

In 2020, 63.4% of students who were current tobacco users reported having stopped using all tobacco for one day or longer in the past year because they were trying to quit for good (Figure 12). Only 36.6% of students who are current tobacco users reported not having tried to quit in the past year. About 15% of Minnesota students who are current tobacco users had tried to quit nearly monthly. National data for 2012 showed that 52.8% of students who currently use tobacco had tried to quit in the past year (59.7% of middle school and 51.4% of high school students)²²

Figure 13. Percent of students who currently use tobacco and tried to quit in the past 12 months, by type of tobacco used in the past 30 days, 2020.



Source: Minnesota Youth Tobacco Survey, 2020.

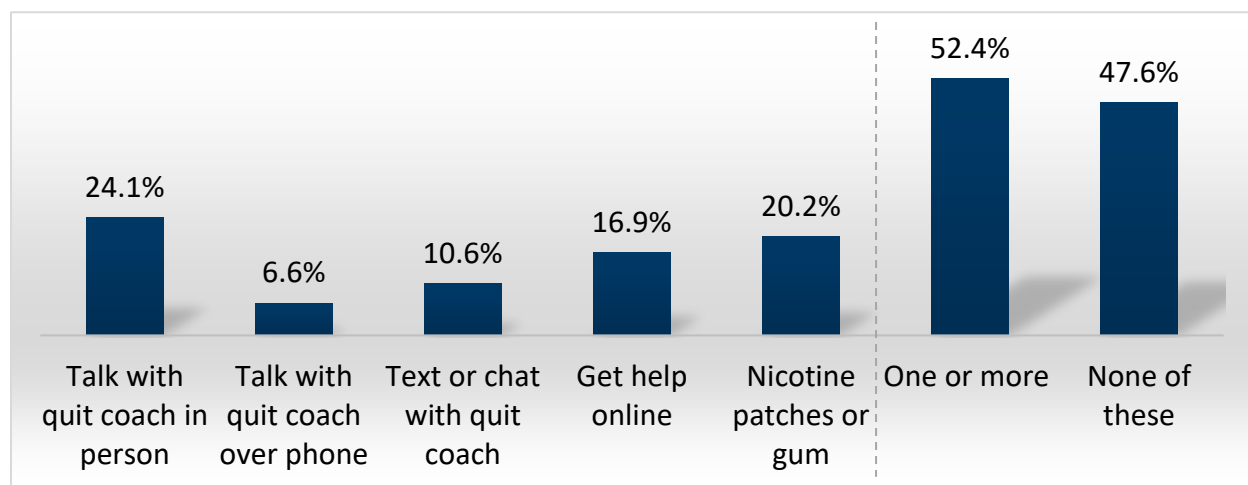
Consistent with past research, polytobacco use (use of more than one type) was inversely associated with making a quit attempt among Minnesota students. A smaller share of students who reported polytobacco use in the past 30 days (48.5%) had attempted to quit using tobacco

in the past year compared to students who exclusively used either e-cigarettes (71.3%) or another type of tobacco (64.1%) (Figure 13). Using more than one type of tobacco can be a sign of nicotine dependence, and nicotine dependence is associated with reduced intentions to quit.

Interest in Quitting Assistance

Many youth think about and try to quit using tobacco, but few know about or have access to services designed to support adolescents through the quitting process. Even when services are available, some young people have the belief that quitting tobacco is not difficult, and report little interest in getting professional help. Others may not approach cessation services that appear to be designed for adults.²⁶

Figure 14. Percent of students who currently use tobacco who reported they would try a type of cessation help if offered for free, 2020.



The 2020 MYTS data show that just over half of students who currently use tobacco (52.4%) were interested in receiving some type of help to quit if offered at no cost (Figure 14). Presented with five different types of cessation support, the largest share were willing to try talking with a quit coach in person (24.1%), followed by nicotine replacement therapy in the form of patches or gum (20.2%) and online help (16.9%). Their least preferred way to receive help was by talking with a quit coach over the phone (6.6%), which underscores the need to offer cessation support for youth in ways that differ from adults.

It is concerning that nearly half of current tobacco users (47.6%) were unwilling to try any of these forms of help, and that students who reported signs of nicotine dependence, and are likely to have more difficulty quitting, were least attracted to help. A larger share of students who were frequent tobacco users (62.5%) selected “none of these” than students who had used tobacco products less often (50.6%).

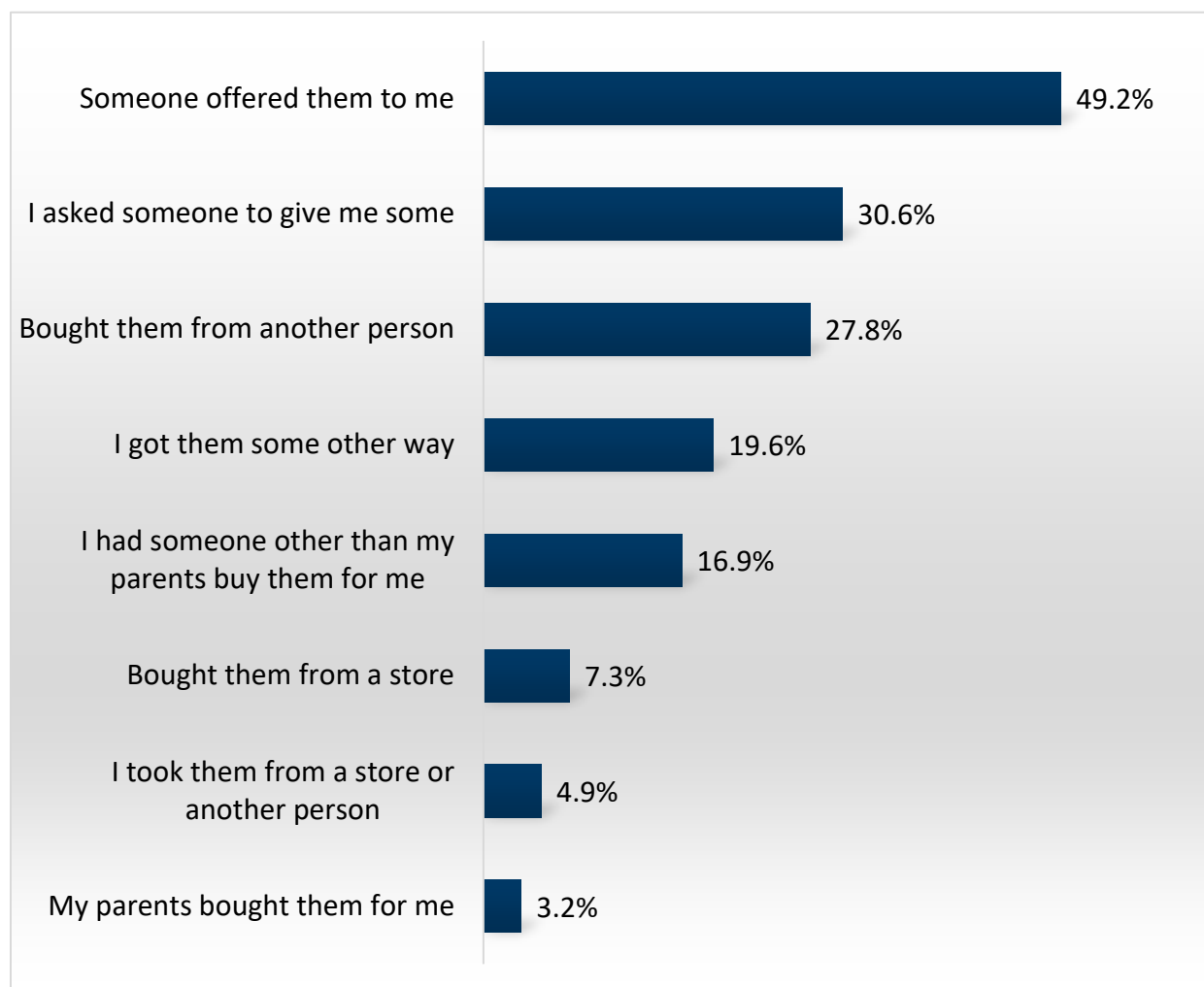
Youth Access to E-Cigarettes

Adolescents often obtain commercial tobacco products, such as cigarettes, cigars, smokeless tobacco, or e-cigarettes, from other people rather than by walking into a store and buying them. However, a substantial number of underage youth report purchasing tobacco products themselves, underscoring the need for better enforcement of existing tobacco restrictions. In 2017, among Minnesota tobacco users under age 18, nearly one in five current smokers bought

their own cigarettes from a store, and 30.5% of e-cigarette users bought their own e-cigarettes from a store.

As of August 2020, Minnesota law prohibits anyone from selling or providing tobacco and tobacco-related products to persons under age 21. This law took effect after the 2020 MYTS survey data were collected. The federal law that raised the legal tobacco purchase age to 21 went into effect December 2019. However, federal laws are less well enforced than state laws, and Minnesota tobacco control and prevention advocates heard anecdotally from retailers that they would not change their business practices until a state law was passed. As a result, since we suspect survey respondents aged 18 or older could buy commercial tobacco products in parts of Minnesota at the time of the survey, they are excluded from the following results.

Figure 15. How students under age 18 who currently use e-cigarettes got their e-cigarettes, 2020.*



Source: Minnesota Youth Tobacco Survey, 2020. Note: comparable data for 2017 were not available.

* Students could check more than one source, so percentages add to more than 100%.

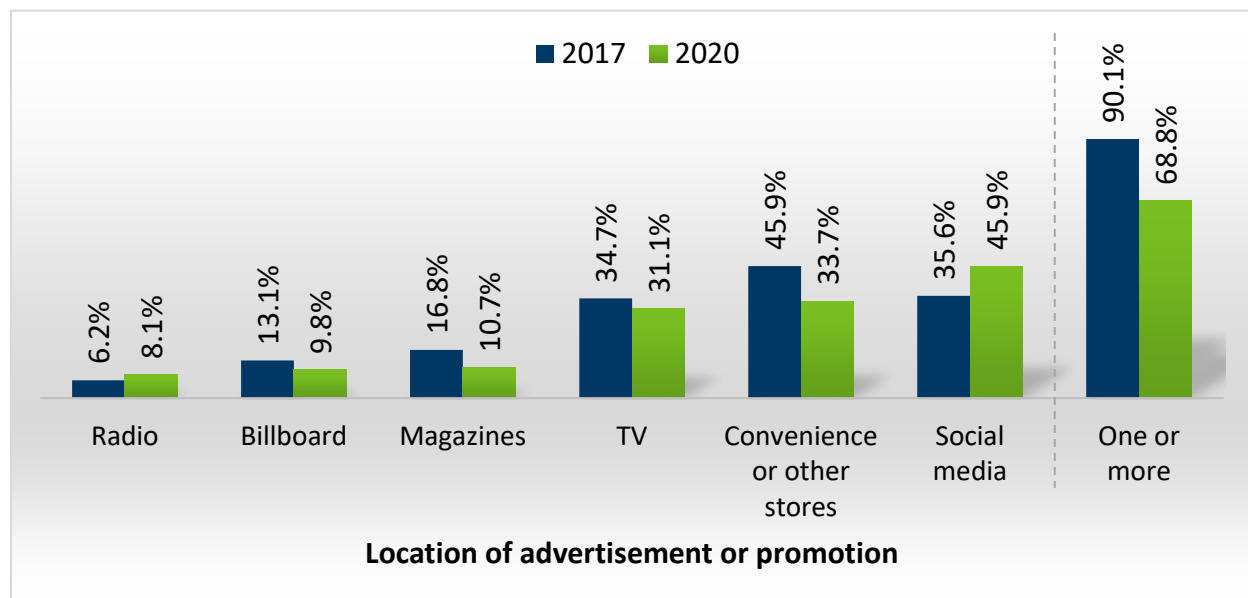
Social sources remain important for youth to have access to commercial tobacco products. About half of students under age 18 who used e-cigarettes in the past 30 days reported someone offered e-cigarettes to them (49.2%), and 30.6% asked someone for them (Figure 15).

Eight percent of high school students under age 18 reported they bought e-cigarettes from a store (including online stores), which is a substantial decline from 30.5% in 2017. This suggests that federal and local age restrictions for purchase may have made it more difficult for many underage teens to buy tobacco products directly from retailers and may have helped curb e-cigarette use among Minnesota’s youth.

Tobacco Advertising

E-cigarettes are the most popular tobacco products among teens, yet e-cigarette marketing remains largely unregulated. E-cigarette advertising is pervasive and uses the same themes of sex, independence, and rebellion that were used to market cigarettes.²⁷ The tobacco industry spends over \$9 billion dollars marketing their products every year, outspending tobacco prevention funding by about 13 to 1.²⁸ Tobacco product advertising works: it reaches youth²⁹ and promotes initiation.^{30,31} The CDC notes that e-cigarette use has increased considerably among U.S. teens in recent years along with e-cigarette advertising expenditures.³²

Figure 16. Percentage of students who reported having seen an advertisement or promotion for e-cigarettes, by source, by year.

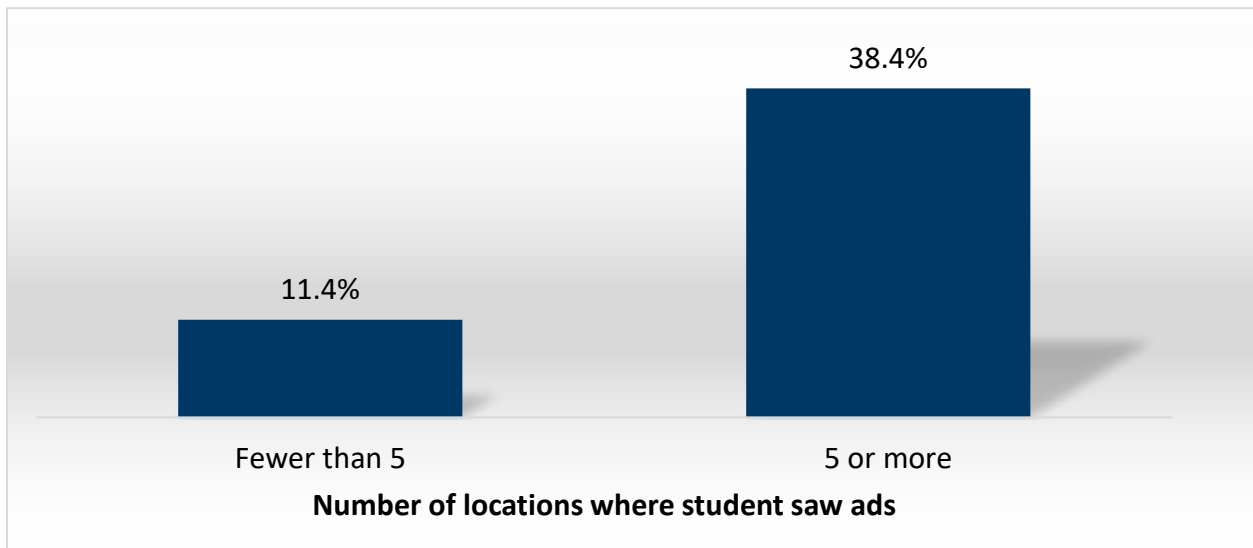


Source: Minnesota Youth Tobacco Survey, 2017-2020.

Significantly fewer students in 2020 (68.8%) reported having seen ads or promotions for e-cigarettes than students in 2017 (90.1%) (Figure 16). Fewer students reported having seen ads on TV, billboards, or in magazines. The drop in the share of students who reported having seen ads in stores is especially welcome, because recall of ads in stores is associated with future e-cigarette initiation.³³

On the other hand, there was a 10 point increase in the percent of students who reported seeing e-cigarette ads on social media. This is concerning because teens typically spend more time on social media than they do shopping in brick-and-mortar stores; a recent study reported that teens typically get over seven hours of screen time daily, not including time spent using screens for school or homework. Teens now report enjoying social media more than watching TV.³⁴

Figure 17. Percent of students who used e-cigarettes in past 30 days, by exposure to e-cigarette advertising, 2020.



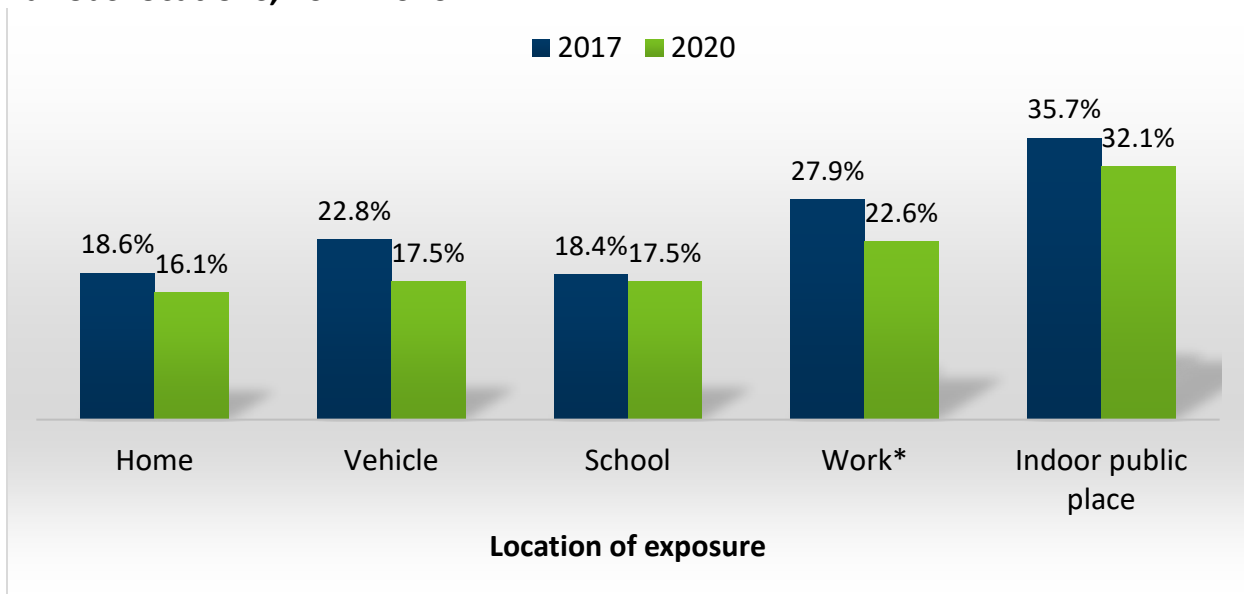
Source: Minnesota Youth Tobacco Survey, 2020.

Students who reported exposure to e-cigarette advertising and promotions in many locations were more likely to report current use of e-cigarettes. Notably, high school students who reported they saw ads for e-cigarettes in five or more locations (such as social media, convenience stores, or TV) were over three times more likely to report current (past 30-day) use of e-cigarettes than those who had seen ads in fewer or no locations (Figure 17).

Exposure to Secondhand Smoke

Tobacco smoke contains more than 7,000 chemicals, including hundreds that are toxic and 70 known to cause cancer. Children who are exposed to secondhand smoke (i.e., smoke from burning tobacco) are at increased risk for sudden infant death syndrome, acute respiratory infections, middle ear disease, more severe asthma, respiratory symptoms, and slowed lung growth.³⁵ Though widespread smoke-free laws in workplaces and public buildings have substantially reduced exposure to secondhand smoke, secondhand smoke exposure is still a health concern for many Minnesota youth.

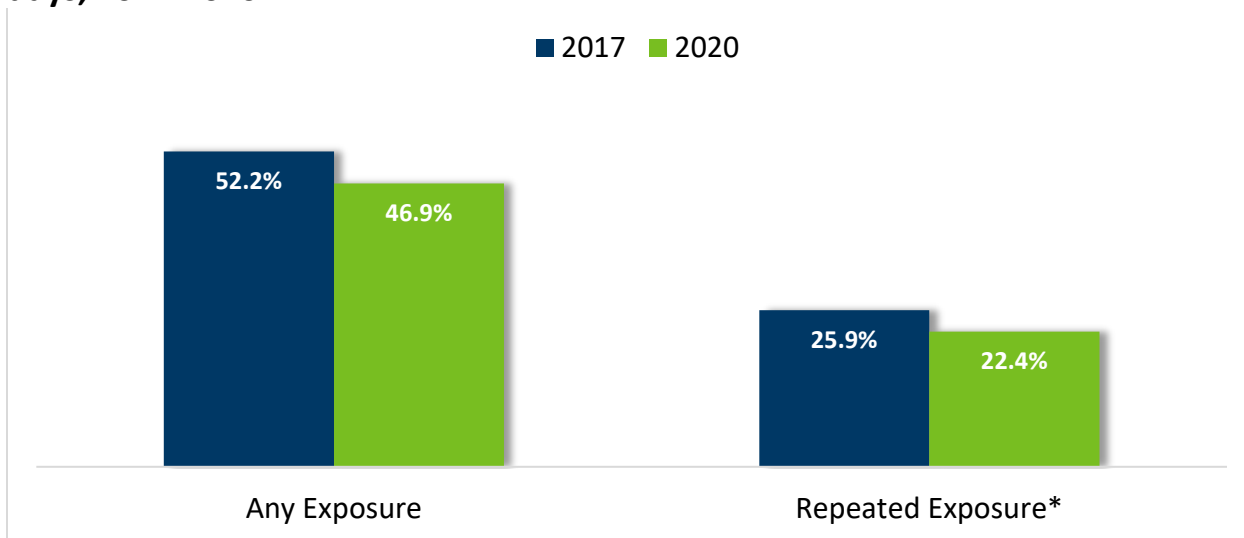
Figure 18. Percent of students who were exposed to secondhand smoke in various locations, 2017-2020.



Source: Minnesota Youth Tobacco Survey, 2017-2020. Declines in prevalence at home, in a vehicle, and at work were statistically significant. *Denominator Includes those who do not have a job or who did not work during the past 7 days.

The percentage of students who reported breathing the smoke of someone else’s cigarette was lower in 2020 than in 2017. Students were significantly less likely to report having been exposed to secondhand smoke at home (16.1%), in a vehicle (17.5%) or at work (22.6%) than in 2017 (Figure 18).

Figure 19. Percent of students who were exposed or repeatedly exposed* to secondhand smoke at home, at work, in a vehicle, or in a public place in past 7 days, 2017-2020.



Source: Minnesota Youth Tobacco Survey, 2017-2020.

*Repeated exposure is 3 or more days of exposure in any of these settings: home, vehicle, school, workplace, or public place.

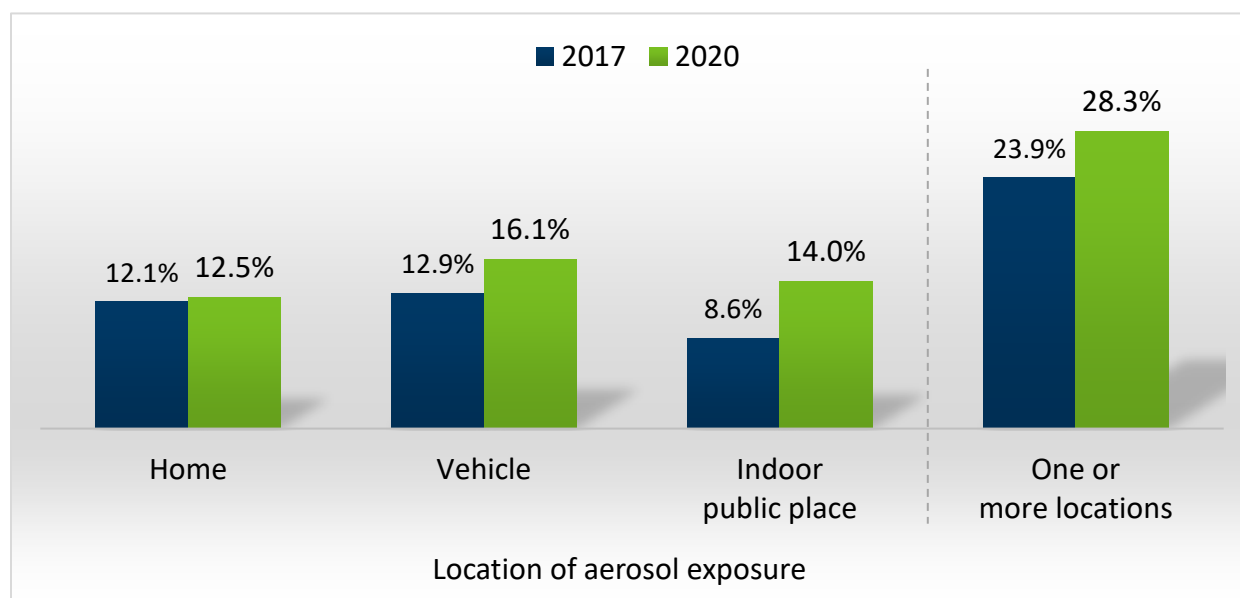
In 2020, 46.9% of middle school and high school students reported they were exposed to secondhand smoke in the past 7 days, a significant reduction in prevalence from 2017 (Figure 19). In addition, significantly fewer students reported repeated exposure to secondhand smoke in 2020 (22.4%) than in 2017 (25.9%).

Exposure to Secondhand Aerosol

Little is known about the health effects of secondhand exposure to e-cigarette aerosol (exhaled e-cigarette “vapor”) on nonusers, especially on vulnerable populations such as youth who have asthma. E-cigarette aerosol contains nicotine, carcinogens, ultra-fine particulate matter exceeding background levels, and metals, such as nickel and chromium, that exceed levels associated with conventional secondhand smoke.³⁶

Although the long-term risks of secondhand aerosol exposure are unknown, studies show that e-cigarette use contaminates the air under controlled³⁷ and real-world conditions,³⁸ extending the potential health risks beyond the user.³⁹ Recent studies provide evidence that exposure to secondhand aerosol from e-cigarettes has immediate effects on respiratory mechanics and exhaled inflammatory biomarkers⁴⁰ and is associated with asthma exacerbation among adolescents.⁴¹

Figure 20. Percent of students who were exposed to secondhand e-cigarette aerosol in the past 30 days, by location of exposure.



Source: Minnesota Youth Tobacco Survey, 2017-2020.

In 2020, 28.3% of students reported having been exposed to e-cigarette aerosol in the past 30 days, a significant increase from 2017 (Figure 20). Students were more likely in 2020 than 2017 to have been exposed to secondhand e-cigarette aerosol in a vehicle (their own or someone else’s) or an indoor public place. The difference in prevalence from 2017 to 2020 for exposure at a home is not statistically significant.

Table 1. Respondent Characteristics, 2017-2020.

| | | 2017 | | 2020 | |
|--|-------------------------------|-------|---------|-------|---------|
| | | Count | Percent | Count | Percent |
| Number of surveys | | 4112 | 100.0% | 2184 | 100.0% |
| Grade | 6th | 416 | 10.2% | 355 | 16.3% |
| | 7th | 599 | 14.6% | 429 | 19.7% |
| | 8th | 837 | 20.5% | 256 | 11.7% |
| | 9th | 531 | 13.0% | 483 | 22.1% |
| | 10th | 1086 | 26.6% | 220 | 10.1% |
| | 11th | 338 | 8.3% | 250 | 11.5% |
| | 12th | 283 | 6.9% | 188 | 8.6% |
| | Total | 4090 | 100.0% | 2183 | 100.0% |
| Grade level | Middle school (6-8) | 1860 | 45.2% | 1040 | 47.7% |
| | High school (9-12) | 2252 | 54.8% | 1141 | 52.3% |
| | Total | 4112 | 100.0% | 2181 | 100.0% |
| Gender | Male | 2039 | 50.2% | 1108 | 50.9% |
| | Female | 2024 | 49.8% | 1068 | 49.1% |
| | Total | 4063 | 100.0% | 2176 | 100.0% |
| Region school is located | Metro (7 counties) | 1880 | 45.7% | 1472 | 67.4% |
| | Greater MN (80 counties) | 2232 | 54.3% | 712 | 32.6% |
| | Total | 4112 | 100.0% | 2184 | 100.0% |
| Do you get free or reduced price lunch? | No | 2455 | 61.6% | 494 | 22.7% |
| | Yes | 1530 | 38.4% | 1162 | 53.4% |
| | Not sure | N/A | N/A | 522 | 24.0% |
| | Total | 3985 | 100.0% | 2178 | 100.0% |
| Race and ethnicity-mutually exclusive groups | American Indian Non-Hispanic | 131 | 3.2% | 20 | 0.9% |
| | Asian Non-Hispanic | 188 | 4.7% | 117 | 5.4% |
| | Black Non-Hispanic | 354 | 8.8% | 191 | 8.8% |
| | Pacific Islander Non-Hispanic | 16 | 0.4% | 2 | 0.1% |
| | White Non-Hispanic | 2610 | 64.6% | 1453 | 67.2% |
| | Multiple Races Non-Hispanic | 272 | 6.7% | 148 | 6.8% |
| | Hispanic | 470 | 11.6% | 232 | 10.7% |
| | Total | 4041 | 100.0% | 2163 | 100.0% |

Source: Minnesota Youth Tobacco Survey, 2017-2020. Category total counts vary due to missing data from unanswered survey questions. N/A means "not applicable."

References

1. Gentzke AS, Wang TW, Jamal A, et al. Tobacco Product Use Among Middle and High School Students—United States, 2020. *Morbidity and Mortality Weekly Report*. 2020;69(50):1881.
2. Ali FRM, Marynak KL, Kim Y, et al. E-cigarette advertising expenditures in the United States, 2014–2018. *Tobacco Control*. 2020:tobaccocontrol-2019-055424.