

Background

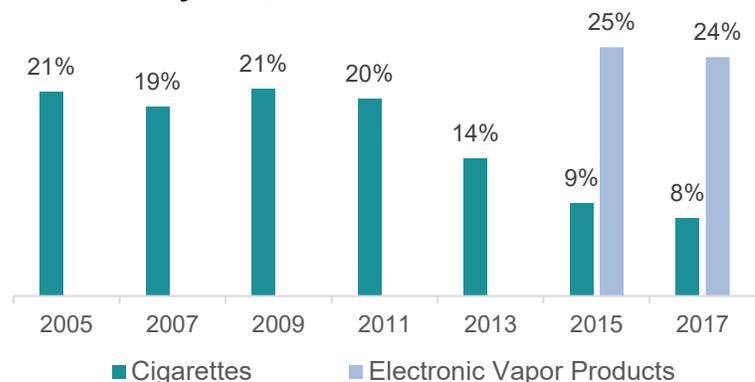
The Surgeon General Report, [E-Cigarette Use Among Youth and Young Adults](#), emphasizes the importance of protecting our children from a lifetime of nicotine addiction and associated health risks by immediately addressing youth e-cigarette use. In recent years, e-cigarette (also known as vaping or juuling) use by youth and young adults has increased at an alarming rate. E-cigarettes are now the most commonly-used tobacco products among youth in the United States¹.

In 2016, after much public input, the U.S. Department of Health and Human Services, Food and Drug Administration (FDA) extended its regulatory authority to all tobacco products that did not previously fall under the FDA's authority². Below is a list of all the tobacco products that currently fall under FDA's Center for Tobacco Products.

- Cigarettes
- Cigars
- Dissolvables
- Heat–Not–Burn
- Hookah Tobacco
- Nicotine Gels
- Pipe Tobacco
- Roll-Your-Own Tobacco
- Smokeless Tobacco Products, including Dip, Snuff, Snus, and Chewing Tobacco
- Vapes, E-Cigs, Hookah Pens, and other Electronic Nicotine Delivery Systems (ENDS)³

The Centers for Disease Control and Prevention (CDC) began collecting data about the use of e-cigarettes by adolescents in 2015 via the Youth Tobacco and Youth Risk Behavior Surveys (YRBS). Nationwide, 13.2% of high school-aged youth reported using an electronic vapor product (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens) on at least one day during the 30 days before the 2017 YRBS

Figure 1: Percentage of High School-Aged Youth Who Reported Using Cigarettes or an Electronic Vapor Product* by Year, 2005-2017



Source: Youth Risk Behavior Survey (YRBS)

*Electronic Vapor Product questions were not on the YRBS until 2015

survey⁴. Adolescent use of electronic cigarettes exceeds the use of cigarettes, cigars and pipes according to the 2015 and 2017 New Hampshire YRBS. Figure 1 (on page 1) shows adolescent use of cigarettes and e-cigarettes across a 13-year span in New Hampshire.

- During the year 2005, 21% of students reported using cigarettes.
- During the year 2007, 19% of students reported using cigarettes.
- During the year 2009, 21% of students reported using cigarettes.
- During the year 2011, 20% of students reported using cigarettes.
- During the year 2013, 14% of students reported using cigarettes.
- During the year 2015, 9% of students reported using cigarettes and 25% reported using an electronic vapor product.
- During the year 2017, 8% of students reported using cigarettes and 24% of students reported using an electronic vapor product.

The figure shows a decline in youth cigarette use in years 2013-2017. The NH Tobacco Prevention and Cessation Program (TPCP) will be able access trend data for adolescent e-cigarette use once the 2019 YRBS data is available.

New Hampshire Youth Risk Behavior Surveys and High School-Aged Youth Use of E-Cigarettes

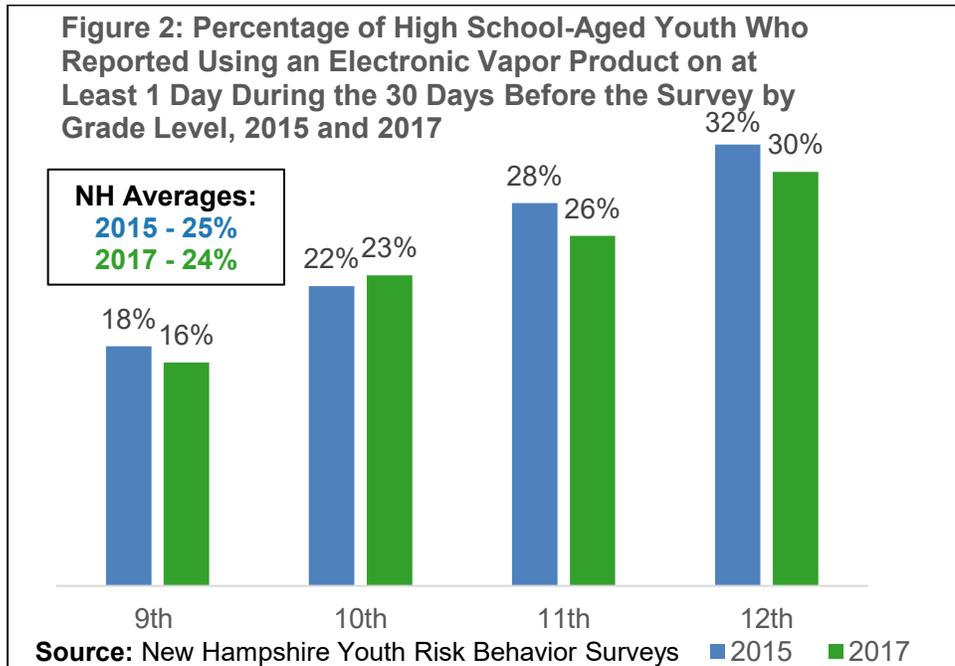
High school-aged youth take the New Hampshire YRBS every two years. Data collected by this survey is a rich source of information and a cornerstone in understanding youth use for the NH Department of Health and Human Services.

This issue brief includes data from the 2015 and 2017 YRBS about the prevalence of high school-aged youth who reported using an electronic vaping product. Below is data by grade, race/ethnicity, and gender identity as these categories showed the most change in e-cigarette use in the high school-aged youth population. The data on gender and geographic demographics was not statistically significant or was limited.

The 2019 YRBS data collection occurred in the spring of 2019. Results will likely be available from CDC by May 2020. TPCP will; then be able to trend and analyze the data to help the public understand the magnitude of adolescent electronic vapor product use.

Grade Level

Figure 2 (below) shows the reported current use of electronic vapor products for high school-aged youth by grade level for 2015 and 2017. Both years show that initiation of use increases with grade level attainment.



- 9th graders were using an electronic vapor product: 18% in 2015 and 16% in 2017
- 10th graders were using an electronic vapor product: 22% in 2015 and 23% in 2017
- 11th graders were using an electronic vapor product: 28% in 2015 and 26% in 2017
- 12th graders were using an electronic vapor product: 32% in 2015 and 30% in 2017.

The New Hampshire average for both years was approximately 25%; there is no statistical significance in this data.

Race/Ethnicity

Race/Ethnicity can play a role in tobacco use. Preliminary data for 2015 and 2017 (see Table 1 on next page) suggests that Hispanic/Latino high school-aged youth are using e-cigarettes more than their peers.

Table 1: Percentage of High School-Aged Youth Who Reported Using an Electronic Vapor Product by Race/Ethnicity, 2015 and 2017 YRBS						
Race/Ethnicity	2015			2017		
	State Average: 25%			State Average: 24%		
	Both	Male	Female	Both	Male	Female
Black	30%	38%	21%	22%	24%	*
Hispanic/Latino	33%	36%	29%	32%	36%	26%
White	24%	25%	23%	24%	27%	20%
All other races**	24%	26%	20%	18%	20%	13%
Multiple races***	30%	35%	24%	22%	23%	19%

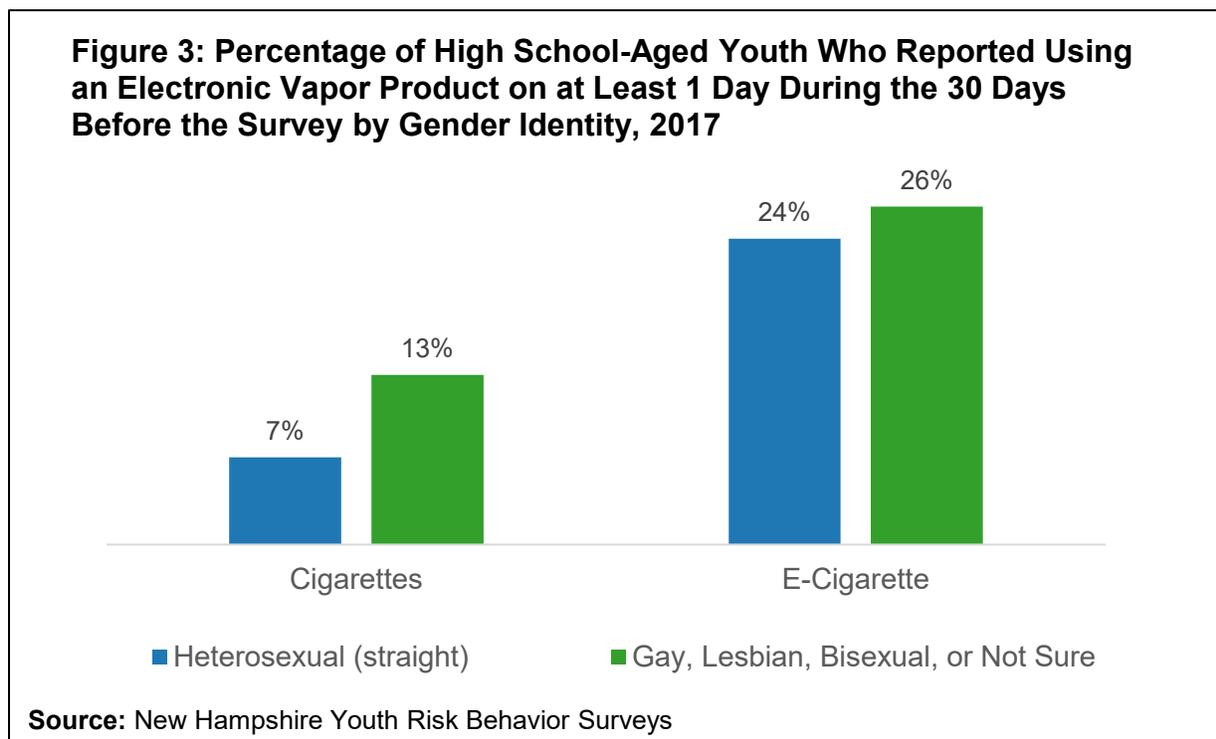
* The number of female respondents who report race as Black or African American has been suppressed as a result of a low response rate.

**Includes respondents that selected any one of the following: American Indian, Alaska Native, Asian, Native Hawaiian, or other Pacific Islander.

***Includes respondents that selected more than one race.

Gender Identify

The 2017 percentage of youth who reported using a cigarette or an electronic vapor device was compared by gender identity (Figure 3).



- Cigarette use was 7% for students that identified as heterosexual and 13% for those who identified as gay, lesbian, bisexual, or not sure.
- E-Cigarette use was 24% for students that identified as heterosexual and 26% for those who identified as gay, lesbian, bisexual, or not sure.

The data highlighted that high school-aged youth that identified as Gay, Lesbian, Bisexual, or Not Sure were almost 2 times more likely to use cigarettes than those that identified as Heterosexual.

What Attracts Youth to Electronic Vaping Products/E-Cigarettes/ Vapes?

According to the U.S. Surgeon General Report, *E-Cigarette Use among Youth and Young Adults*, the variety of flavors are one of the main reasons youth are attracted to these devices. Many flavors of liquid nicotine are similar to other youth products, such as a children’s cereal name. Unique flavors of liquid nicotine can play a significant role in youth initiation and continued use.

Sales of e-cigarettes in the United States have risen rapidly since 2007. Widespread advertising via television commercials and through print advertisements for popular brands, often featuring celebrities, has contributed to a large increase in e-cigarette use by both adults and youth since 2010.



Finally, early data suggests adolescents co-occurring use of e-cigarettes, tobacco cigarette and cannabis are common.^{5,6}

Nicotine and Adolescent Brain Development

Nicotine is a highly-addictive chemical found in all tobacco products, including e-cigarettes and liquid nicotine. Nicotine use during adolescence impacts brain development, specifically the area called the prefrontal cortex. The prefrontal cortex is the area of the brain that affects impulsivity and decision-making and is one of the areas that matures last. When an adolescent’s prefrontal

cortex is exposed repeatedly to nicotine, their brain chemistry will change and this can lead to an addiction.

The brain continues to develop through the mid-twenties. Using tobacco during adolescence increases the risk of developing psychiatric disorders and cognitive impairment later in life. In addition, adolescent smokers suffer from attention deficits, which worsen with the years of smoking⁷.

Recommendations

- Recognize tobacco company marketing efforts target adolescents by using social influencers and product labeling that imitate images with brand recognition (see image on the right);
- Educate youth, parents, and caregivers on the health effects of repeated exposure to nicotine in an adolescent brain which will result in chemical changes to the brain;
- Continue to educate audiences about new electronic vaping products;
- Create more tobacco-free environments, including e-cigarettes; and
- Encourage parents to talk with their child or children about the health effects of tobacco products, including e-cigarettes.



Image Courtesy of the FDA

Conclusions

1. Nationally and in New Hampshire, adolescents do not think vaping or juuling is harmful.
2. According to the 2016 Surgeon General's Report, *E-Cigarette Use among Youth and Young Adults*, adolescents who use vaping products commonly will also use cigarettes.
3. Adolescents often mimic adult behavior, especially when they see people they think are "cool" such as celebrities.
4. The number and type of unique names and flavors of liquid nicotine plays a significant role in youth initiation and continued use.
5. The adolescent brain (prefrontal cortex) is affected when nicotine products are used.

For more information or technical assistance

New Hampshire Department of Health and Human Services
Division of Public Health Services
Tobacco Prevention & Cessation Program

Telephone: (603) 271-6891 Email: TPCP@dhhs.nh.gov
www.dhhs.nh.gov/dphs/tobacco/index.htm

References

1. U.S. Department of Health and Human Services. *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
2. U.S. Food and Drug Administration. (2016). The Facts on the FDA's New Tobacco Rule. Retrieved 7/12/2019 from <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm506676.htm>.
3. U.S. Food and Drug Administration, Vaporizers, E-Cigarettes, and other Electronic Nicotine Delivery Systems (ENDS). Retrieved 7/12/2019 from <https://www.fda.gov/TobaccoProducts/Labeling/ProductsIngredientsComponents/ucm456610.htm>.
4. Kann L, McManus T, Harris WA, et al. Youth Risk Behavior Surveillance — United States, 2017. *MMWR Surveill Summ* 2018;67(No. SS-8):1–114. DOI: <http://dx.doi.org/10.15585/mmwr.ss6708a1>
5. Sunday Azagba, E-cigarette use, dual use of e-cigarettes and tobacco cigarettes, and frequency of cannabis use among high school students, retrieved 8/1/19 from <https://doi.org/10.1016/j.addbeh.2017.12.028>
6. Alexandra Loukas, C. Nathan Marti, Maria Cooper, Keryn E. Pasch, Cheryl L. Perry, Exclusive e-cigarette use predicts cigarette initiation among college students, Retrieved 8/1/19 from <https://www.sciencedirect.com/science/article/pii/S0306460317303210>
7. Goriounova, N. A., & Mansvelder, H. D. (2012). Short- and Long-Term Consequences of Nicotine Exposure during Adolescence for Prefrontal Cortex Neuronal Network Function. *Cold Spring Harbor Perspectives in Medicine*, 2(12), 10.1101/cshperspect.a012120 a012120. Retrieved 2/8/2017 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3543069>.

Works Consulted

1. Tsai J, Walton K, Coleman BN, et al. Reasons for Electronic Cigarette Use Among Middle and High School Students — National Youth Tobacco Survey, United States, 2016. *MMWR Morb Mortal Wkly Rep* 2018;67:196–200. DOI: <http://dx.doi.org/10.15585/mmwr.8m6706a5externalicon>
2. Villanti AC, Johnson AL, Ambrose BK, et al. Flavored Tobacco Product Use in Youth and Adults: Findings From the First Wave of the PATH Study (2013-2014). *American journal of preventive medicine*. 2017.