The Youth Vaping Epidemic How flavors addict kids

Teens are nearly 7x more likely to vape nicotine than adults.^{1, 2}



Overview

The rise of e-cigarettes and flavored tobacco products threatens the health of California youth. Only 2% of California high school students smoke cigarettes, while 11% use e-cigarettes.⁵ Among young adults 18-24, only 6% smoke cigarettes, but 15.5% use e-cigarettes.⁶ Overall, youth are far more likely to use flavored tobacco products than adults.^{5,6}

E-cigarettes and youth

- Over 20,000 California stores sell e-cigarettes and vaping products. Nearly all of them (95%) sell flavored vaping products.⁷ In addition to familiar kid-friendly flavors like fruit punch, sour apple and mango, youth are also exposed to a wide variety of made up flavors like Unicorn Poop and Dragon's Blood.
- Over 15,000 flavors of e-cigarette and vaping products are on the market.⁸
- The most popular e-cigarette flavors among U.S. high school students are fruit flavors, followed by mint or menthol, followed by sweet flavors.⁹
- E-cigarettes can cause heart harm and possibly even cancer. Many of the chemicals that cause these harms come from the flavors.¹⁰⁻¹³
- Some chemicals common in flavored e-liquids are toxic to lung cells.^{14, 15}

Mint and menthol flavors

- Popularity of menthol and mint e-cigarette flavors increased among U.S. high school e-cigarette users from 2018 to 2019.⁹ In 2019, the popular e-cigarette maker, Juul, stopped selling all flavors of their pods except for menthol and tobacco.
- Mint/menthol flavors are the most commonly available flavor in stores that sell e-cigarette and vaping products (90%).⁷
- Menthol or mint flavored products may contain a cancer-causing chemical called pulegone. Users of mint and menthol e-cigarette are exposed to high levels of pulegone – more than the FDA allows in food.¹⁶





Problem: Vaping is a youth epidemic

- Flavors entice youth to try vaping. They mask the harsh taste of tobacco and the product names sound fun and innocent.
- Youth nicotine use can lead to addiction and harm the developing brain, impacting learning, memory and attention.¹⁷
- The newest vaping devices contain high levels of nicotine. Some can have as much nicotine as up to two packs of cigarettes.¹⁸⁻²⁰





Most popular flavors among high school exclusive e-cigarette users in the U.S.



Source: National Youth Tobacco Survey, 2018-2019

Be part of the solution

Talk to your children about the risks of tobacco use, including e-cigarettes and vaping products.

Visit FlavorsHookKids.org to download the parent's guide and learn more about these addictive products.

Educators and schools can use e-cigarette prevention education resources like the Stanford **Tobacco Prevention Toolkit and**

California Department of Education's Comprehensive Tobacco-Free School Policy Toolkit with students.

The American Academy of

Pediatricians has e-cigarette resources for pediatricians including resources to assist with young patients who vape.

To help teens guit vaping, refer them to free phone, online, and text Quit Vaping services or use the free thisisquitting.com app designed for teens.

California communities are taking action

75 California communities and counting have taken action to restrict flavored tobacco products. Large and small, urban and rural, more communities like Yolo County, Alturas, Hermosa Beach and San Francisco, are making changes to protect their youth against these harmful tobacco products.

¹ Dai H, Leventhal AM. Prevalence of e-Cigarette Use Among Adults in the United States, 2014-2018. JAMA. September 2019. doi:10.1001/jama.2019.15331

² Cullen KA, Ambrose BK, Gentzke AS, Apelberg BJ, Jamal A, King BA. Notes from the Field: Use of Electronic Cigarettes and Any Tobacco Product Among Middle and High School Students — United States, 2011–2018. MMWR Morb Mortal Wkly Rep. 2018;67:1276–1277. DOI: <u>http://dx.doi.org/10.15585/mmwr.mm6745a5</u>

³ Rostron BL, Cheng YC, Gardner LD, Ambrose BK. Prevalence and Reasons for Use of Flavored Cigars and ENDS among US Youth and Adults: Estimates from Wave 4 of the PATH Study, 2016-2017. Am J Health Behav. 2020;44(1):76–81. doi:10.5993/AJHB.44.1.8

⁴ Cullen KA, Gentzke AS, Sawdey MD, et al. E-cigarette Use Among Youth in the United States, 2019. JAMA. 2019

⁵ California Student Tobacco Survey, 2017-18. San Diego, CA: Center for Research and Intervention in Tobacco Control, University of California, San Diego; April 2019.

⁶ California Health Interview Survey, 2018. Los Angeles, CA: UCLA Center for Health Policy Research; October 2019.

⁷ Schleicher NC, Johnson TO, Ali A, Winn L, Vishwakarma M, Henriksen L. California Tobacco Retail Surveillance Study 2018. Palo Alto, CA: Stanford Prevention Research Center. 2019.

⁸ Hsu G, Sun JY, Zhu SH. Evolution of Electronic Cigarette Brands From 2013-2014 to 2016-2017: Analysis of Brand Websites. J Med Internet Res. 2018;20(3):e80. Published 2018 Mar 12. doi:10.2196/jmir.8550

[°] Centers for Disease Control and Prevention. National Youth Tobacco Survey (NYTS). Atlanta, Georgia: US Department of Health and Human Services, CDC; 2018-2019.

¹⁰ Jensen RP, Luo W, Pankow JF, Strongin RM, Peyton DH. Hidden formaldehyde in e-cigarette aerosols. N Engl J Med. 2015;372(4):392–394. doi:10.1056/NEJMc1413069

¹¹ Hess CA, Olmedo P, Navas-Acien A, Goessler W, Cohen JE, Rule AM. E-cigarettes as a source of toxic and potentially carcinogenic metals. *Environ Res.* 2017;152:221–225. doi:10.1016/j.envres.2016.09.026

¹² Khlystov A, Samburova V. Flavoring Compounds Dominate Toxic Aldehyde Production during E-Cigarette Vaping. Environ Sci Technol. 2016;50(23):13080–13085. doi:10.1021/acs.est.6b05145

¹³ Qu Y, Kim KH, Szulejko JE. The effect of flavor content in e-liquids on e-cigarette emissions of carbonyl compounds. *Environ Res.* 2018;166:324–333. doi:10.1016/j.envres.2018.06.013

¹⁴ Park HR, O'Sullivan M, Vallarino J, et al. Transcriptomic response of primary human airway epithelial cells to flavoring chemicals in electronic cigarettes. Sci Rep. 2019;9(1):1400. Published 2019 Feb 1. doi:10.1038/s41598-018-37913-9
¹⁵ Clapp PW, Lavrich KS, van Heusden CA, Lazarowski ER, Carson JL, Jaspers I. Cinnamaldehyde in flavored e-cigarette liquids temporarily suppresses bronchial epithelial cell ciliary motility by dysregulation of mitochondrial function. Am J Physiol Lung Cell Mol Physiol. 2019;316(3):L470–L486. doi:10.1152/ajplung.00304.2018

¹⁶ Jabba SV, Jordt S. Risk Analysis for the Carcinogen Pulegone in Mint- and Menthol-Flavored e-Cigarettes and Smokeless Tobacco Products. JAMA Intern Med. 2019;179(12):1721–1723.

¹⁷ 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.
¹⁸ Benowitz NL, Jacob P 3rd. Daily intake of nicotine during cigarette smoking. *Clin Pharmacol Ther.* 1984;35(4):499–504. doi:10.1038/clpt.1984.67

¹⁹ Stanford Medicine. Stanford Tobacco Prevention Toolkit: Unit 6 - What are JUULs & Other Pod-Based Systems? [Power Point slides]. Retrieved from <u>https://med.stanford.edu/tobaccopreventiontoolkit/E-Cigs/ECigUnit6.html</u>. 2019.

²⁰ Jarvis MJ, Boreham R, Primatesta P, Feyerabend C, Bryant A. Nicotine yield from machine-smoked cigarettes and nicotine intakes in smokers: evidence from a representative population survey. *J Natl Cancer Inst.* 2001;93(2):134–138. doi:10.1093/jnci/93.2.134