

**New York State Senate Committees on Consumer Protection, Health, and Education  
Public Hearing on Vaping and Electronic Cigarette Safety**

**Written Testimony from Campaign for Tobacco-Free Kids  
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The Campaign for Tobacco-Free Kids is pleased to submit this written testimony on the critical issue of vaping and e-cigarette safety. The Campaign for Tobacco-Free Kids is the nation's largest non-profit, non-governmental advocacy organization solely devoted to reducing tobacco use and its deadly toll by advocating for public policies that prevent kids from using tobacco, help smokers quit and protect everyone from secondhand smoke.

We are at a critical juncture in our nation's public health history. After making tremendous progress in reducing youth tobacco use over the past several decades, e-cigarettes—JUUL in particular—are threatening to undermine declines in overall youth tobacco use.

New York has long been a national leader in its commitment to reducing the death and disease from tobacco use. It is encouraging to see that New York continues to take thoughtful, evidenced-based steps to reduce the number of kids who start using tobacco and help tobacco users quit. We are glad that New York is seeking to address the serious problem of e-cigarette use among New York youth.

### **Youth E-Cigarette Use in the United States is a Public Health Crisis**

Youth e-cigarette use in the United States has skyrocketed to what the U.S. Surgeon General and the FDA have called “epidemic” levels.<sup>i</sup> It is a public health crisis and *it is getting worse*.

Newly released data from the 2019 National Youth Tobacco Survey (NYTS) shows that e-cigarette use among high school students more than doubled from 2017 to 2019, to 27.5 percent of students, or more than 1 in 4 high schoolers.<sup>ii</sup> Altogether, 5 million middle and high school students used e-cigarettes in 2019 – an increase of nearly 3 million users in two years.<sup>iii</sup> Another national study showed that e-cigarette use among 8th, 10th and 12th graders has more than doubled in the past two years.<sup>iv</sup> Now, 9% of 8th graders, 20% of 10<sup>th</sup> graders and 25% of 12<sup>th</sup> graders are current vapers.<sup>v</sup>

What is happening is without precedent. Researchers at the University of Michigan who conduct the Monitoring the Future Study found that the increase in youth vaping of nicotine from 2017 to 2018 was the single largest increase in youth use of any substance in the survey's 43-year history.<sup>vi</sup> And then it increased again this year.<sup>vii</sup> E-cigarettes are addicting a new generation of kids and threaten to reverse decades of progress in reducing youth tobacco use.

Youth e-cigarette use in New York mirror the epidemic levels that are seen nationwide. According to the most recent New York State Youth Tobacco Survey (NYS-YTS), between 2014 and 2018, the rate of e-cigarette use among high school youth in New York more than doubled, from 10.5% in 2014 to 27.4% in 2018.<sup>viii</sup> Furthermore, newly released data indicates that an alarming 36.7% of 12<sup>th</sup> grade students in New York State reported current e-cigarette use in 2018.<sup>ix</sup> E-cigarettes remain the most commonly used tobacco product among New York youth, surpassing cigarettes, cigars, smokeless tobacco, and hookah.<sup>x</sup> New York has made great

strides in reducing youth smoking rates – cigarette smoking among high school students declined by 82% between 2000 and 2018. Alarming, from 2016 to 2018 the rate increased from 4.3% to 4.8%, the first increase in cigarette smoking among youth in New York since 2000.<sup>xi</sup>

Both the Commissioner of the FDA and the Surgeon General of the United States have recognized that youth usage of e-cigarettes has reached epidemic proportions. According to Norman E. “Ned” Sharpless, Acting Commissioner of the FDA, “Years of progress to combat youth use of tobacco – to prevent lifetimes of addiction to nicotine – is now threatened by an epidemic of e-cigarette use by kids.”<sup>xii</sup> In December 2018, Surgeon General Jerome Adams issued an advisory on e-cigarette use among youth, declaring the growing problem an “epidemic.” The Surgeon General called for “aggressive steps to protect our children from these highly potent products that risk exposing a new generation of young people to nicotine.”<sup>xiii</sup>

### **Youth E-Cigarette Users Are At Increased Risk of Smoking Cigarettes**

Alarming, evidence continues to build that for young people, using e-cigarettes increases the likelihood of smoking cigarettes.

- Last year, the National Academies of Science, Engineering & Medicine (NASEM) released a comprehensive report finding substantial evidence that e-cigarette use increases risk of ever using cigarettes among youth and young adults.<sup>xiv</sup>
- In 2016, the Surgeon General concluded that while more research is needed, evidence from several longitudinal studies suggests that e-cigarette use is “strongly associated” with the use of other tobacco products among youth and young adults, including conventional cigarettes.<sup>xv</sup>
- From 2013 to 2016, youth (ages 12-15) e-cigarette use was associated with more than four times the odds of trying cigarettes and nearly three times the odds of current cigarette use. This translates to over 43,000 current youth cigarette smokers who might not have become smokers without e-cigarettes.<sup>xvi</sup>
- The risk of progressing to smoking regular cigarettes is not just for youth who were already at risk for smoking. In fact, several studies find that the link between e-cigarette use and smoking initiation is stronger for those who had *lower* risk factors for smoking at baseline.<sup>xvii</sup>

### **Youth E-Cigarette Users Struggle With Nicotine Addiction**

And we now know that large numbers of youth are not just experimenting, they are becoming addicted. In fact, more than a quarter (27.7%) of high school e-cigarette users and 16% of middle

school e-cigarette users – more than 900,000 middle and high school students – are frequent users, using e-cigarettes on at least 20 of the preceding 30 days. Frequent product use is more prevalent for e-cigarettes than for cigarettes.<sup>xxiii</sup> Alarmingly, 1 in 9 high school seniors (11.7%) report vaping nicotine on a near daily basis, a strong sign of addiction.<sup>xxix</sup> This means that nearly half (46%) of high school seniors who vape nicotine vape nearly every day. One-third of 10th graders who vape nicotine vape nearly every day.

Sadly, the numbers and research are confirmed by parents and pediatricians across the country. E-cigarette use, especially Juul, has permeated schools and the daily life of hundreds of thousands of youth. It is clear that large numbers of teen e-cigarette users are struggling with nicotine addiction and withdrawal. Last November, the New York Times profiled Matt Murphy from Reading, Mass., who had his first Juul when he was 17. He described the euphoric head rush of nicotine as “love at first puff.” He quickly became addicted to Juul’s intense nicotine hits. He became so dependent on the Juul that he nicknamed the device his “11th finger.”<sup>xxx</sup> He is not alone. The problem is so bad that earlier this year FDA convened two public hearings to gather input on how to help youth addicted to the nicotine in e-cigarettes. No one is quite sure how to help these youth quit.

### **E-Cigarettes Pose Serious Risks to Kids’ Health**

According to the Surgeon General, “E-cigarette use poses a significant – and avoidable – health risk to young people in the United States. Besides increasing the possibility of addiction and long-term harm to brain development and respiratory health, e-cigarette use is associated with the use of other tobacco products that can do even more damage to the body.”<sup>xxxi</sup> The widespread use of e-cigarettes among young people raises particular concerns because they almost always use products that contain nicotine, and since the introduction of Juul, are now often using products that effectively deliver very large doses of nicotine.<sup>xxii</sup> Nicotine is a highly addictive drug that can harm the developing adolescent brain and impact learning, memory and attention. Using nicotine in adolescence also has been shown to increase the risk of future addiction, including to cigarettes and to other drugs.<sup>xxiii</sup> Adolescents are more likely to experience nicotine dependence at lower levels of exposure than adults and can feel dependent after just minimal exposure and within a relatively short period of time.<sup>xxiv</sup> The 2016 U.S. Surgeon General’s report concluded that youth use of nicotine in any form, including e-cigarettes, is unsafe.<sup>xxv</sup>

It should not be surprising that there are reports of youth becoming addicted more rapidly and more intensely to e-cigarettes than was previously recorded for cigarettes. A single Juul can deliver as much nicotine as a pack of cigarettes.<sup>xxvi</sup> This is even more dangerous because Juul delivers nicotine without the harsh taste and smell of regular cigarettes, allowing users to inhale high levels of nicotine more easily and with less irritation than other e-cigarettes that are designed differently.<sup>xxvii</sup> One study estimated that youth could meet the threshold for nicotine

addiction by consuming just one quarter of a JUULpod per day.<sup>xxxviii</sup> Research has also found that young Juul users often do not know the products they are using contains nicotine.<sup>xxxix</sup>

Delivered in high doses, nicotine can be lethal. The Surgeon General's report and the NASEM report both found that contact with e-liquids can cause adverse health effects and ingesting e-liquids can lead to death.<sup>xxx</sup> Exposure to liquid nicotine found in e-cigarettes has resulted in thousands of calls to poison control centers in recent years according to the American Association of Poison Control Centers (AAPCC).<sup>xxxi</sup> The FDA is currently investigating over 100 cases of reported seizures that may be linked to nicotine poisoning from e-cigarette use.<sup>xxxii</sup>

E-cigarettes can also expose users to other harmful chemicals. Studies have found that e-cigarettes can contain harmful and potentially harmful constituents, including formaldehyde, acrolein, volatile organic compounds, and metals like nickel and lead.<sup>xxxiii</sup> While we do not yet know the long-term effects of e-cigarette use, e-cigarettes have been found to increase heart rate and blood pressure, and initial research indicates that the aerosol can damage DNA and the respiratory system.<sup>xxxiv</sup> But because the products are relatively new, there is not enough information to assess the long-term impact on cancer and heart disease risk.

No vaping product is safe for youth consumption, and flavored e-cigarettes may pose unique harms. According to the Surgeon General, "while some of the flavorings used in e-cigarettes are generally recognized as safe for ingestion as food, the health effects of their inhalation are generally unknown."<sup>xxxv</sup> According to the FDA, "Flavorings that are safe for use in food may become toxic when these chemicals are heated and inhaled. Some have been shown to be harmful to the lungs."<sup>xxxvi</sup>

The increasing number of vaping related pulmonary illnesses around the country only heightens the concern about initiation of vaping by youth.<sup>xxxvii</sup> We do not yet know the cause of the recent outbreak of serious lung illnesses among e-cigarette users, but the most recent report from CDC indicates that 11 percent of the patients report using only nicotine containing products. 64 percent of the patients report using nicotine (just not exclusively).<sup>xxxviii</sup>

As of October 22, 2019, 1604 cases of e-cigarette, or vaping, product use associated with lung injury have been reported to CDC and 34 deaths have been confirmed in 24 states.<sup>xxxix</sup> Sadly, as of October 29, 2019, New York State has reported 156 vaping-related patients, ranging in age from 14-71.<sup>xl</sup> On October 8, 2019, Governor Cuomo announced the first vaping-related death in New York State – the victim was only 17 and is the youngest vaping fatality in the U.S.<sup>xli</sup>

Doctors report that the lung damage in some people who have become ill after vaping resemble a chemical burn. Speaking about the pattern of injuries observed in the lungs, a surgical pathologist recently noted, "To be honest, they look like the kind of change you would expect to see in an unfortunate worker in an industrial accident where a big barrel of toxic chemicals spills, and that person is exposed to toxic fumes and there is a chemical burn in the airways."<sup>xlii</sup>

Because FDA has not reviewed any of these products, we know far too little about the potential risks of using these products and that should be of concern to all of us.

### **Flavored E-Cigarettes Have Fueled Youth Use**

Flavors improve the taste and mask the harshness of tobacco products, making it easier for kids to try the product and ultimately become addicted. There is conclusive evidence that flavors play a key role in youth initiation and continued use of tobacco products. In fact, over 80 percent of kids who have used tobacco started with a flavored product.<sup>xliii</sup>

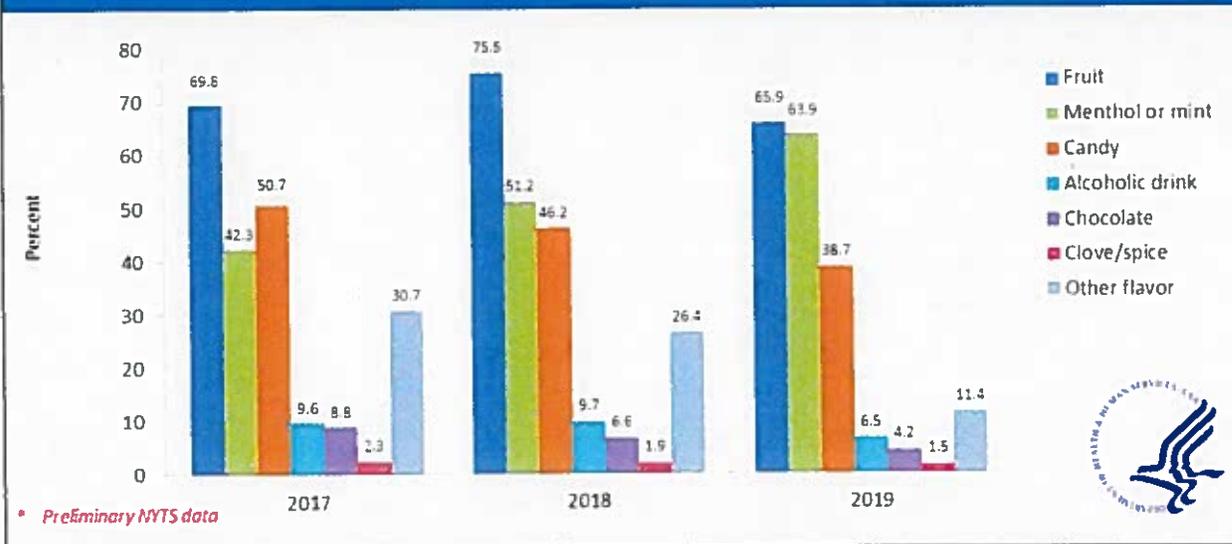
Flavored e-cigarettes continue the tobacco industry's long history of targeting kids with flavored products. Despite the foreseeable risks of marketing flavored nicotine products, manufacturers flooded the market with flavored e-cigarettes with little or no regard for the impact these products would have on youth. The consequences should not be a surprise to anyone.

- E-cigarette companies market more than 15,000 flavors to kids – from mango and mint to cotton candy and gummy bear.<sup>xliiv</sup>
- Nearly all (97%) of current youth e-cigarette users have used a flavored e-cigarette in the past month and 70 percent of you current youth e-cigarette users say they use e-cigarettes “because they come in flavors I like” (according to data from the government’s Population Assessment of Tobacco and Health, PATH, study).<sup>xlv</sup>
- The percentage of high school e-cigarette users who reported using mint and menthol flavors increased from 51.2 percent in 2018 to 63.9 percent in 2019. Mint and menthol flavors are about as popular as fruit flavors among high school e-cigarette users.<sup>xlvi</sup> Similarly, in New York, preference for mint or menthol flavored e-cigarettes among adolescent e-cigarette users increased significantly between 2017 and 2019, from 19.9% in 2017 to 34.1% in 2019. Preference for mint or menthol flavored e-cigarettes is second to fruit flavors (51.8%) among adolescent e-cigarette users in New York.<sup>xlvii</sup>

### **Effective Regulations Must Restrict All E-Cigarette Flavors to Protect Kids**

The evidence is clear that that all flavored tobacco products are appealing to youth and that if exemptions are made for certain flavors, kids will migrate to them. In fact, research shows that mint and menthol-flavored e-cigarettes are *growing* in popularity among youth. The 2019 NYTS found that 63.9% of high school e-cigarette users use mint or menthol flavors, an increase from 51.2% in 2018 and 43.3% (see below). Nationally, mint and menthol flavors are about as popular as fruit flavors among high school e-cigarette users.<sup>xlviii</sup>

## FLAVORS POPULAR AMONG HIGH SCHOOL USERS OF E-CIGARETTES\*



This increase in the popularity of mint and menthol flavors directly coincides with JUUL's changing market share. In late 2018, JUUL announced that it was removing all of its flavors except tobacco, mint and menthol from retail stores (while keeping all flavors available online). This action had no impact on overall youth use of e-cigarettes. However, due to the highly-addictive qualities of JUUL and similar products, young users of fruit and candy flavors simply shifted to using mint and menthol flavors.

Sales data echo the patterns seen among youth – the market share for mint and menthol e-cigarettes has grown substantially since youth are easily substituting mango and fruit with mint and menthol. In October 2019, JUUL/Altria announced that they would cease online sales of all non-tobacco, mint and menthol flavors. It's clear this action will not protect kids and recent press reports make clear that this action will not limit sales.

- According to the *New York Times*, mint and menthol make up 80% of JUUL's sales.<sup>lix</sup>
- According to the *Associated Press*, JUUL's other flavors—mango, crème, fruit and cucumber—made up less than 10% of sales once they were only available online.<sup>l</sup>

These data make clear that any attempts to ban the sale of flavored e-cigarettes need to be applied to *all* flavors to be effective.

The single most important action that could be taken to reduce youth e-cigarette use would be to prohibit the flavors that make these products so attractive to youth and easy for them to use. The

evidence is clear that it is the flavors that lures kids to these products. Banning flavors in e-cigarettes will reduce the likelihood that youth use these products and expose themselves to unknown chemicals and their related health consequences. The high rates of youth e-cigarette use in New York and the recent outbreak of vaping-related lung injuries makes it even more pressing to reduce the appeal of these products to youth and young adults.

<sup>i</sup> Office of the Surgeon General, "Surgeon General's Advisory on E-Cigarette Use Among Youth," December 18, 2018, <https://e-cigarettes.surgeongeneral.gov/documents/surgeon-generals-advisory-on-e-cigarette-use-among-youth-2018.pdf>.

<sup>ii</sup> FDA, "Trump Administration Combating Epidemic of Youth E-Cigarette Use with Plan to Clear Market of Unauthorized, Non-Tobacco-Flavored E-Cigarette Products," September 11, 2019, [https://www.fda.gov/news-events/press-announcements/trump-administration-combating-epidemic-youth-e-cigarette-use-plan-clear-market-unauthorized-non?utm\\_source=CTPEblast&utm\\_medium=email&utm\\_term=statout&utm\\_content=pressrelease&utm\\_campaign=ctp-vaping](https://www.fda.gov/news-events/press-announcements/trump-administration-combating-epidemic-youth-e-cigarette-use-plan-clear-market-unauthorized-non?utm_source=CTPEblast&utm_medium=email&utm_term=statout&utm_content=pressrelease&utm_campaign=ctp-vaping).

Current use defined as any use in the past month.

<sup>iii</sup> Edney, A., et al., "Vaping Furor Intensifies as Trump Vows Tough U.S. Scrutiny", *Bloomberg*, September 11, 2019, <https://www.bloomberg.com/news/articles/2019-09-11/trump-to-hold-meeting-on-vaping-after-reports-of-u-s-illness>.

<sup>iv</sup> Miech, R, et al., "Trends in Adolescent Vaping, 2017-2019," *New England Journal of Medicine*, published online September 18, 2019.

<sup>v</sup> Miech, R, et al., *Trends in Adolescent Vaping, 2017-2019, New England Journal of Medicine*, published online September 18, 2019.

<sup>vi</sup> University of Michigan, Monitoring the Future Study, 2018. <http://monitoringthefuture.org/data/18data/18drbtb3.pdf>

<sup>vii</sup> Miech, R, et al., "Trends in Adolescent Vaping, 2017-2019," *New England Journal of Medicine*, published online September 18, 2019.

<sup>viii</sup> NYS DOH, Bureau of Tobacco Control, StatShot Vol. 12, No. 1, Jan. 2019,

[https://www.health.ny.gov/prevention/tobacco\\_control/reports/statshots/volume12/n1\\_electronic\\_sig\\_use\\_increase.pdf](https://www.health.ny.gov/prevention/tobacco_control/reports/statshots/volume12/n1_electronic_sig_use_increase.pdf)

<sup>ix</sup> NYS DOH, Bureau of Tobacco Control, StatShot Vol. 12, No. 4, Oct. 2019,

[https://www.health.ny.gov/prevention/tobacco\\_control/reports/statshots/volume12/n4\\_eciq\\_trends.pdf](https://www.health.ny.gov/prevention/tobacco_control/reports/statshots/volume12/n4_eciq_trends.pdf)

<sup>x</sup> NYS DOH, Bureau of Tobacco Control, StatShot Vol. 12, No. 4, Oct. 2019,

[https://www.health.ny.gov/prevention/tobacco\\_control/reports/statshots/volume12/n4\\_ecig\\_trends.pdf](https://www.health.ny.gov/prevention/tobacco_control/reports/statshots/volume12/n4_ecig_trends.pdf)

<sup>xi</sup> NYS DOH, Bureau of Tobacco Control, StatShot Vol. 12, No. 1, Jan. 2019,

[https://www.health.ny.gov/prevention/tobacco\\_control/reports/statshots/volume12/n1\\_electronic\\_sig\\_use\\_increase.pdf](https://www.health.ny.gov/prevention/tobacco_control/reports/statshots/volume12/n1_electronic_sig_use_increase.pdf)

<sup>xii</sup> FDA, *Statement on the agency's actions to tackle the epidemic of youth vaping and court ruling on application submission deadlines for certain tobacco products, including e-cigarettes*, Statement from Acting Commissioner of Food and Drug Administration, July 15, 2019,

<https://www.fda.gov/news-events/press-announcements/statement-agencys-actions-tackle-epidemic-youth-vaping-and-court-ruling-application-submission>.

<sup>xiii</sup> Office of the Surgeon General, *Surgeon General's Advisory on E-Cigarette Use Among Youth*, December 18, 2018, <https://e-cigarettes.surgeongeneral.gov/documents/surgeon-generals-advisory-on-e-cigarette-use-among-youth-2018.pdf>.

<sup>xiv</sup> National Academies of Sciences, Engineering, and Medicine. 2018. *Public health consequences of e-cigarettes*. Washington, DC: The National Academies Press. <http://nationalacademies.org/hmd/Reports/2018/public-health-consequences-of-e-cigarettes.aspx>.

<sup>xv</sup> HHS, *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. See also, Leventhal, AM, et al., "Association of Electronic Cigarette Use With Initiation of Combustible Tobacco Product Smoking in Early Adolescence," *Journal of the American Medical Association*, 314(7): 700-707, 2015. Wills, Thomas A, et al., "Longitudinal study of e-cigarette use and onset of cigarette smoking among high school students in Hawaii," *Tobacco Control*, published online first January 25, 2016. Wills, TA, et al., "E-cigarette use is differentially related to smoking onset among lower risk adolescents," *Tobacco Control*, published online August 19, 2016. Barrington-Trimis, JL, et al., "E-Cigarettes and Future Cigarette Use," *Pediatrics*, 138(1), published online July 2016.

<sup>xvi</sup> Barrington-Trimis, JL, et al., "E-Cigarettes and Future Cigarette Use," *Pediatrics*, 138(1), published online July 2016. Wills, TA, et al., "E-cigarette use is differentially related to smoking onset among lower risk adolescents," *Tobacco Control*, published online August 19, 2016.

<sup>xvii</sup> Berry, KM, et al., "Association of Electronic Cigarette Use with Subsequent Initiation of Tobacco Cigarettes in US Youths," *JAMA Network Open*, 2(2), published online February 1, 2019.

<sup>xviii</sup> Barrington-Trimis, JL, et al., "E-Cigarettes and Future Cigarette Use," *Pediatrics*, 138(1), published online July 2016. Wills, TA, et al., "E-cigarette use is differentially related to smoking onset among lower risk adolescents," *Tobacco Control*, published online August 19, 2016.

<sup>xix</sup> Centers for Disease Control and Prevention (CDC), "Use of Electronic Cigarettes and Any Tobacco Product Among Middle and High School Students—United States, 2011-2018," *Morbidity and Mortality Weekly Report (MMWR)*, 67(45): 1276-1277.

<sup>xx</sup> Miech, R, et al., "Trends in Adolescent Vaping, 2017-2019," *New England Journal of Medicine*, published online September 18, 2019.

<sup>xxi</sup> Jan Hoffman, "The Price of Cool: A Teenager, a Juul and Nicotine Addiction," November 16, 2018 *The New York Times*,

<https://www.nytimes.com/2018/11/16/health/vaping-juul-teens-addiction-nicotine.html>

<sup>xxii</sup> HHS, *Know the Risks: E-Cigarettes & Young People*, accessed March 15, 2018 at <https://e-cigarettes.surgeongeneral.gov/knowtherisks.html>.

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[combating-epidemic-youth-e-cigarette-use-plan-clear-market-unauthorized-non?utm\\_source=CTPEblast&utm\\_medium=email&utm\\_term=stratout&utm\\_content=pressrelease&utm\\_campaign=ctp-vaping](#) Current use defined as any use in the past month. See also, CDC, "Use of Electronic Cigarettes and Any Tobacco Product Among Middle and High School Students—United States, 2011-2018," *MMWR*, 67(45): 1276-1277.

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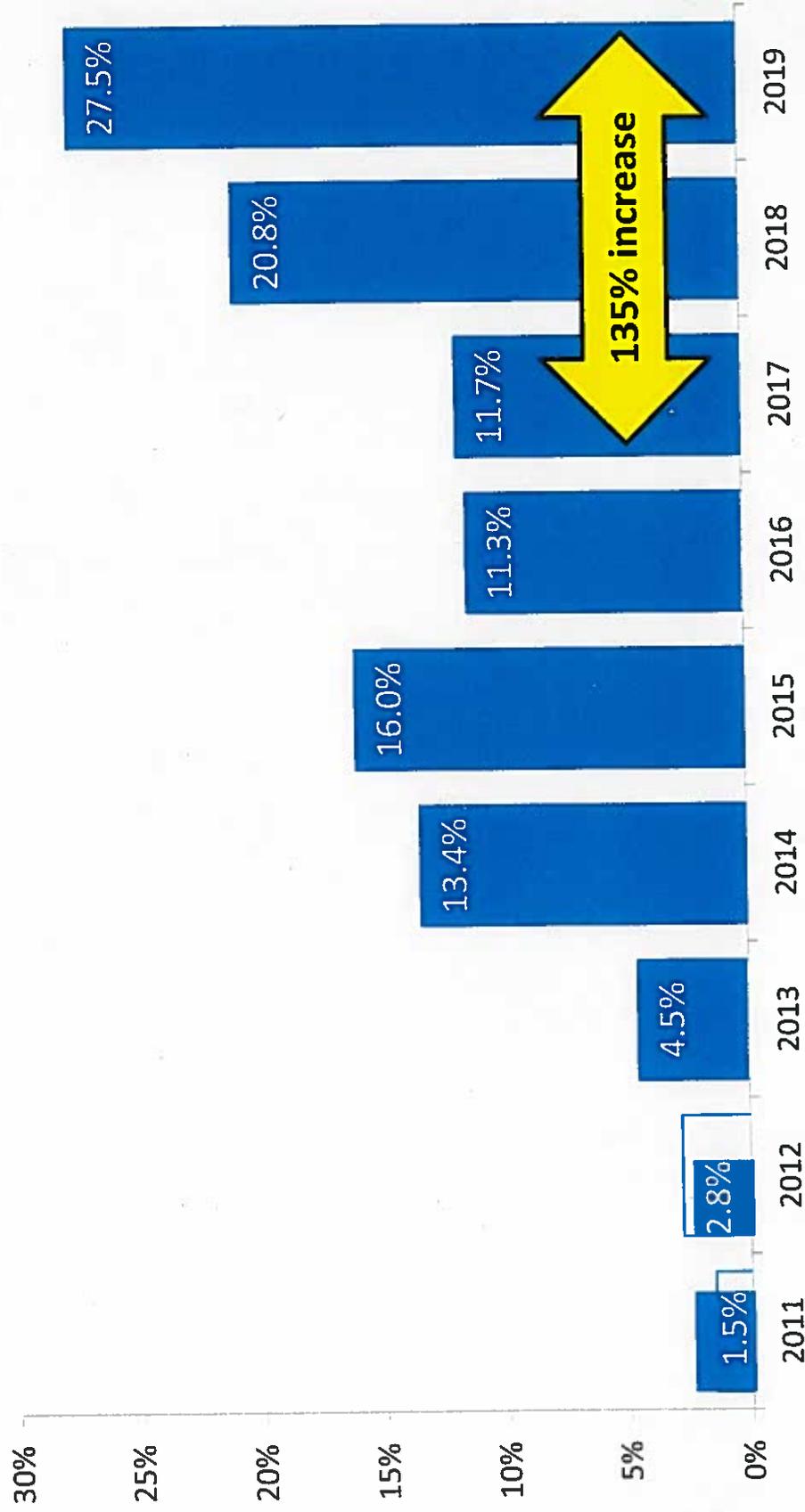
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<https://apnews.com/d3beff8e79934a828edf35de0ba4c2a3>



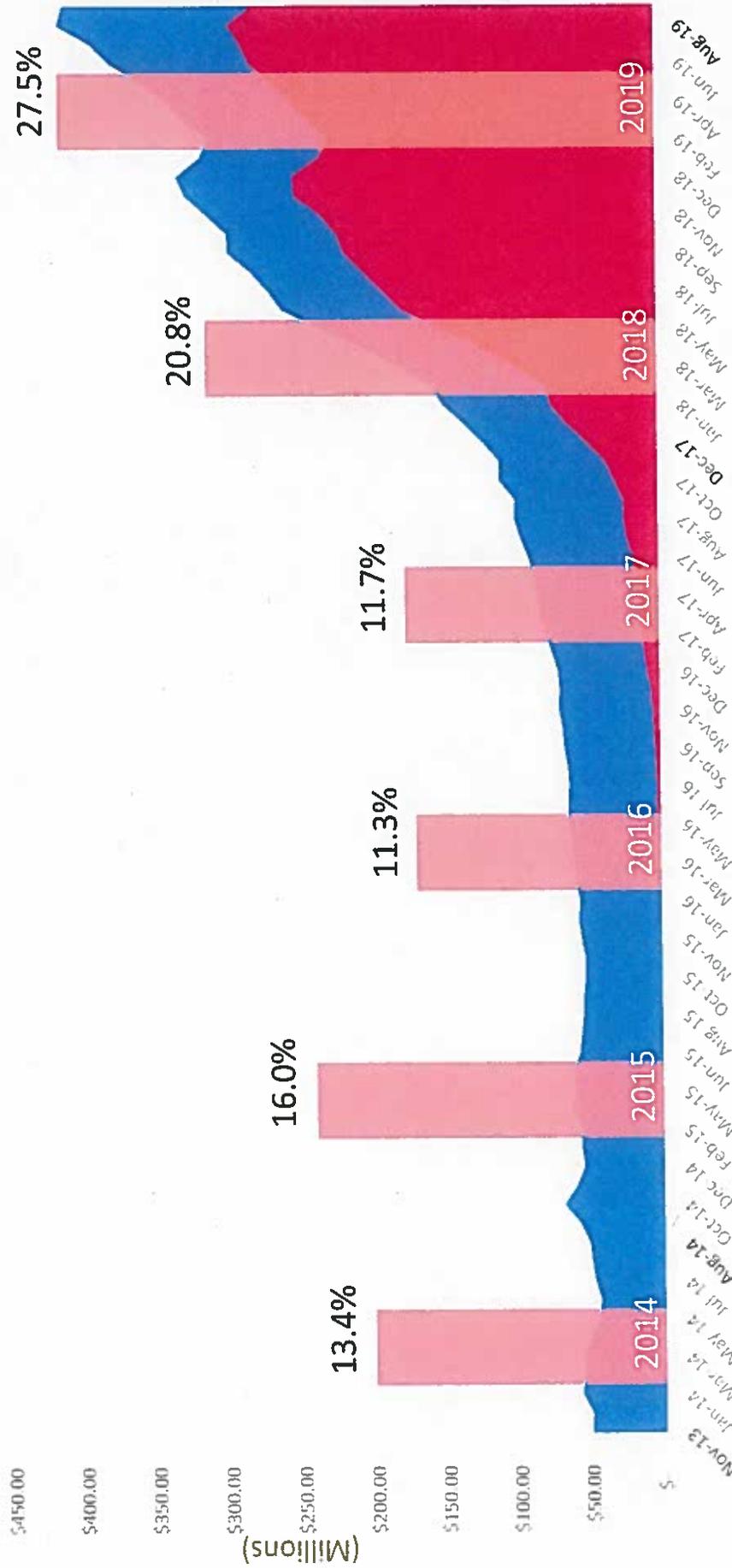
# High School E-Cigarette Use 2011-2019 (past 30 day use)



Source: CDC, National Youth Tobacco Survey (NYTS)

# Monthly E-Cigarette Sales and Youth E-Cigarette Use Rates

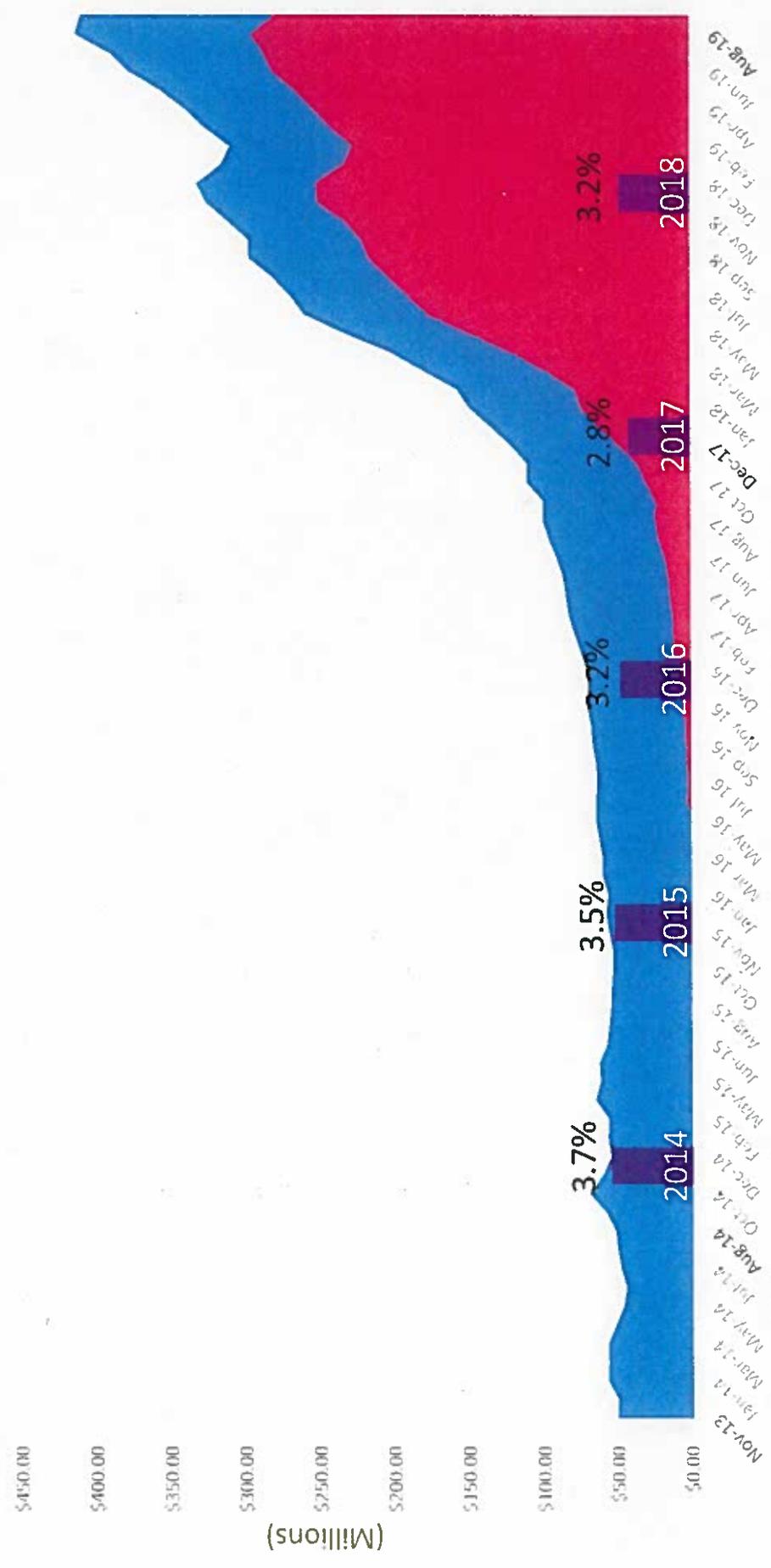
CAMPAIGN  
for  
TOBACCO-FREE  
Kids



Data courtesy of the Public Health Law Center Tobacco Control Legal Consortium

Nielsen All-Channel Data from sales from convenience stores and mass merchandisers; does not include online sales or sales from tobacco and vape shops. The "All Others" category is used as a proxy for JUUL in the Nielsen market data from June 2016 through May 2017, separate JUUL data were not available until June 2017.

# Monthly E-Cigarette Sales and Adult E-Cigarette Use Rates



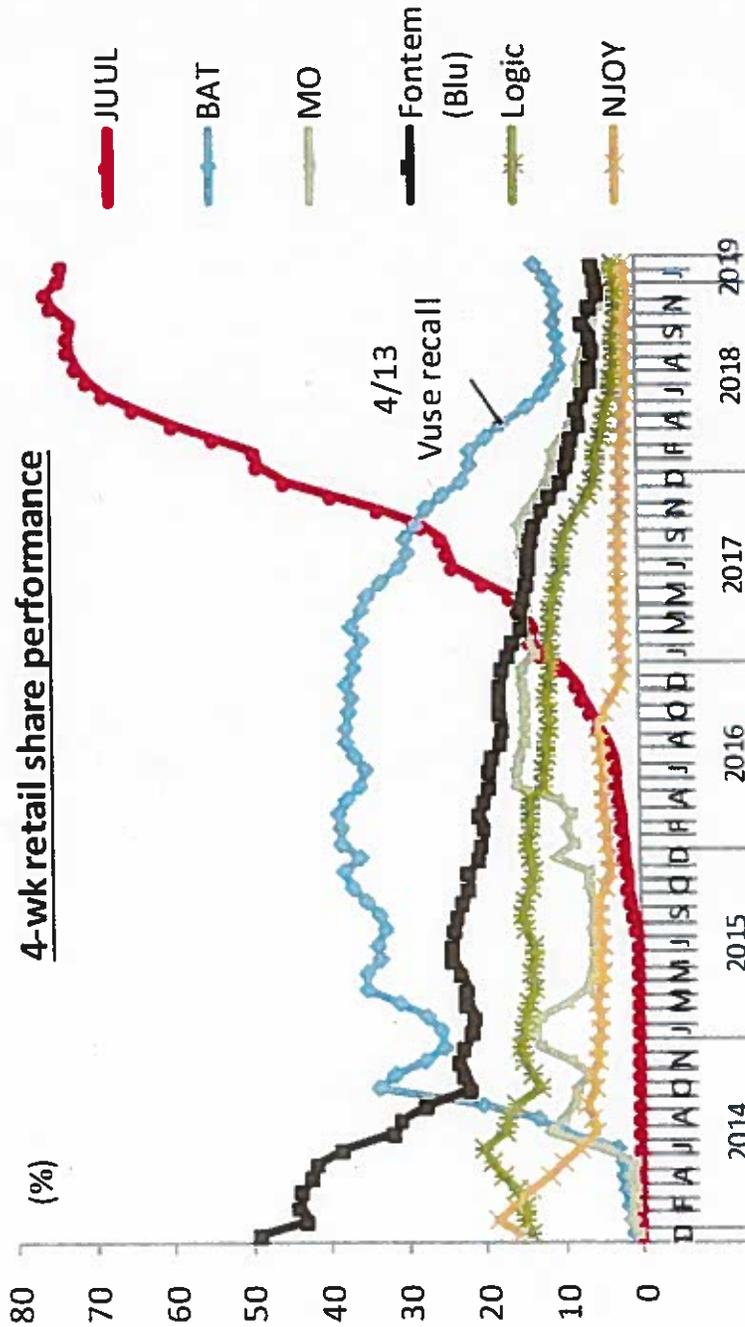
Data courtesy of the Public Health Law Center Tobacco Control Legal Consortium

Nielsen All-Channel Data from sales from convenience stores and mass merchandisers; does not include online sales or sales from tobacco and vape shops. The "All Others" category is used as a proxy for JUUL in the Nielsen market data from June 2016 through May 2017, separate JUUL data were not available until June 2017.

CAMPAIGN  
for  
TOBACCO-FREE  
Kids

# Is JUUL to Blame?

## E-Cig 4-wk Share Performance Overall

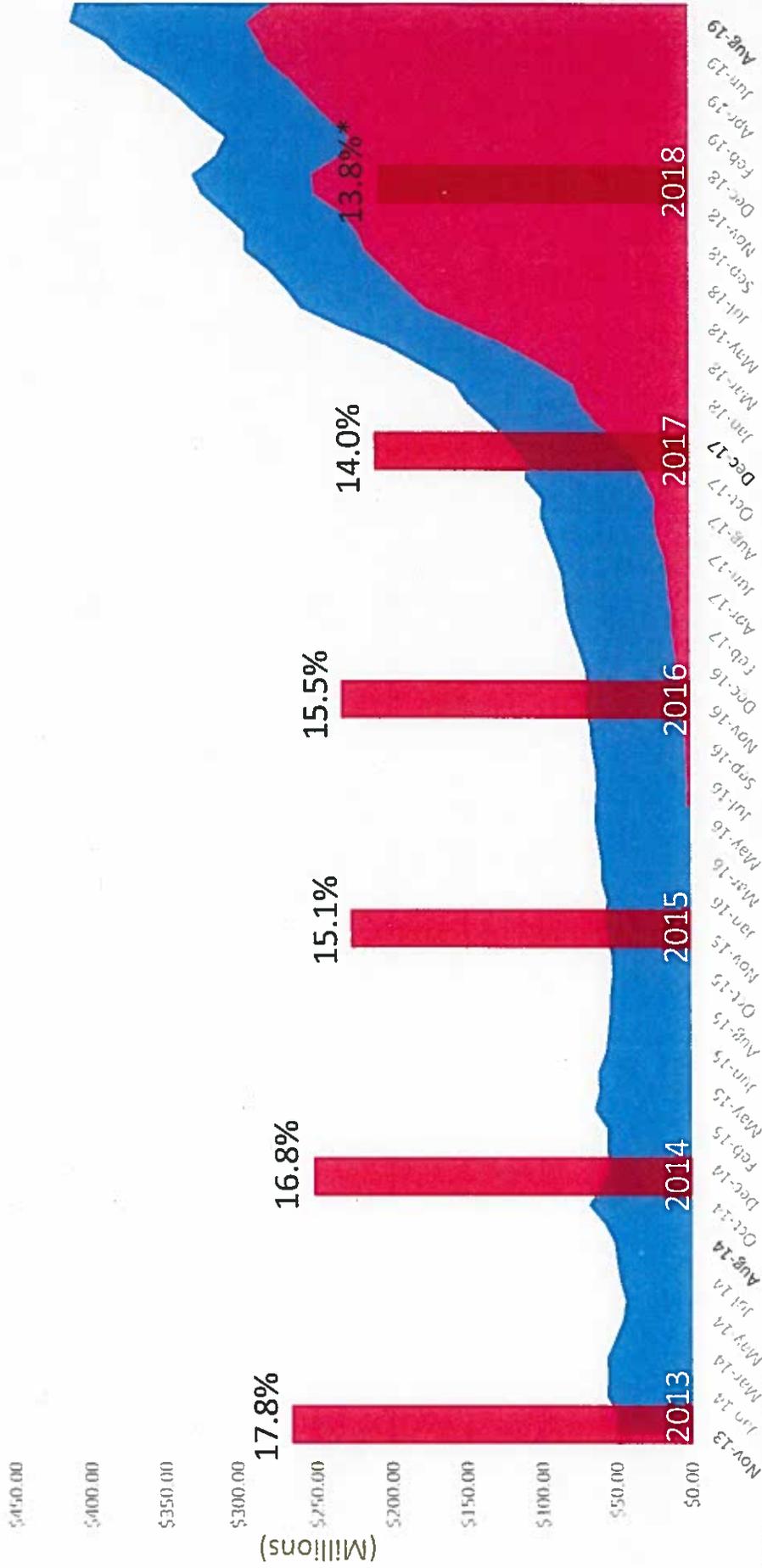


Through February 23, 2019

Source: Nielsen Total US xAOC/Convenience Database & Wells Fargo Securities, LLC

# Monthly E-Cigarette Sales and Adult Smoking Rates

CAMPAIGN  
for  
TOBACCO-FREE  
Kids



Data courtesy of the Public Health Law Center Tobacco Control Legal Consortium

■ Market Total ■ JUUL ■ NHIS Year-End Rate

\*2018 data based on NHIS estimate

Nielsen All-Channel Data from sales from convenience stores and mass merchandisers; does not include online sales or sales from tobacco and vape shops. The "All Others" category is used as a proxy for JUUL in the Nielsen market data from June 2016 through May 2017, separate JUUL data were not available until June 2017.