

E-Cigarette Use Among Teens

Accelerating Harmful Costly

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What are E-Cigarettes?

While the Center for Disease Control (CDC) reports overall growth in cigarette use among adolescents, the organization also reports growth in a relatively new method of smoking: electronic cigarettes (e-cigs or “vape pens”).^{1,17} As explained by Grana, “electronic cigarettes are products that deliver a nicotine-containing aerosol (commonly called vapor) to users by heating a solution typically made up of propylene glycol or glycerol (glycerin), nicotine, and flavoring agents.”² E-cigarettes come in numerous shapes, sizes, and designs, including light displays and other personal customizations (Figure 1).

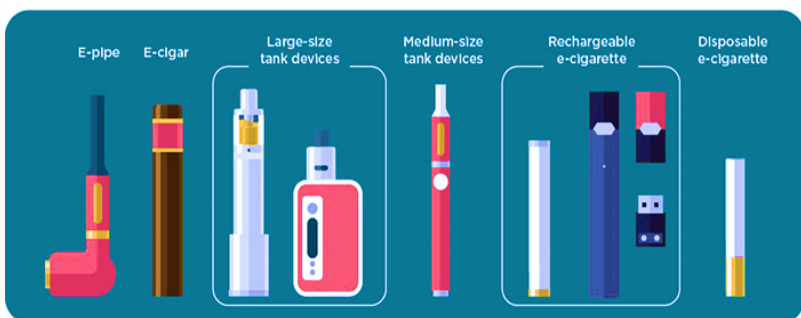


Figure 1; Source: Center for Disease Control, E-Cig Fact Sheet

What are the trends?

Recent reports by the CDC show that e-cigarette use among U.S. high school students is not only growing but is growing exponentially with a **78% increase in usage between 2017 and 2018**.¹⁶ In 2018, 1 in every 5 high school students used e-cigs.¹⁷ This drastic upward trend in e-cigarette use among U.S. high school students is accompanied by an exponential upward trend in e-cigarette advertising expenditures, with \$451.9 million spent in 2011 and an estimated \$759.3 million spent in 2016.^{4,19} A complementary survey reveals the reach of these advertisements with **68.9% of U.S. middle and high school students reporting exposure to at least one form of e-cigarette advertisement**.⁴ The upward trend in e-cigarette use can be viewed in Figure 2; it reveals the percentage of students using tobacco and e-cig products from 2011 to 2018.

Hazardous...and Hip

Teens who viewed e-cigarette advertisements were more likely to perceive e-cigarettes as “cooler, more fun, healthier, and more enjoyable.”⁵ Furthermore, one cross-sectional survey of 6th, 8th, and 10th-grade students found that e-cigarette users had higher likelihoods of reporting that e-cigarettes were “not at all harmful” or “not all addictive.”⁶ This perception of harmlessness has been continuously disproven with research that links health defects to inhaling the vapors and nicotine from e-cigs; specifically, a study by Wang found a 30% increase in breathing problems in cases that smoked e-cigs.³ The “not all addictive” perception has been disproven through the studied addictive nature of nicotine, no matter the method of inhalation.² The World Health Organization (WHO) also found that e-cigs cause health defects through “efficient” nicotine delivery; the inhaled nicotine was labeled a “**tumor promoter**” and a “**neurodegenera[tor]**.”¹⁴ WHO also discovered that the aerosols in e-cigs contain “toxicants,” such as formaldehyde.¹⁴ **Thus, public health campaigns will have to overcome the youths’ perception that e-cigarettes are “cool” and not as harmful or as addictive.**

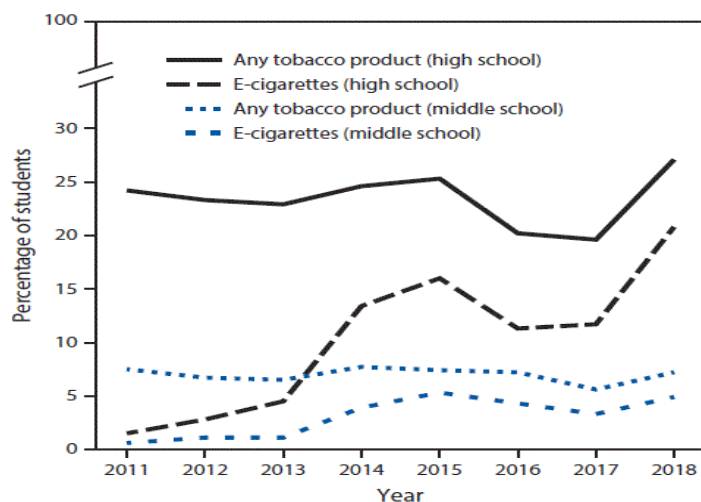
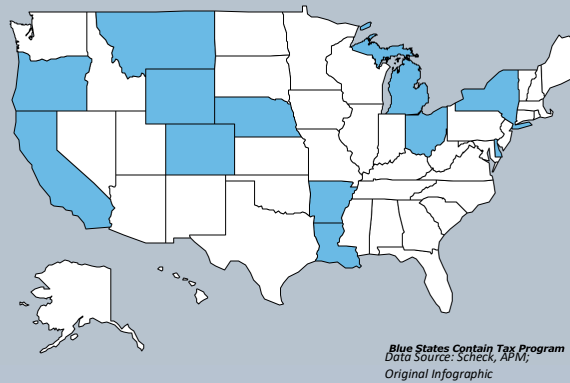


Figure 2; Source: K. Cullen Et Al, MMWR

Combatting an Epidemic

Thirteen states have created tax-funded tobacco use prevention programs that directly target adolescent e-cig use (Blue States, Figure 3).⁷ As reported by Scheck, Colorado saw that 26% of their high schoolers were smoking e-cigs and invested \$1.5 million in e-cig prevention, and California saw 17% of their high schoolers smoking e-cigarettes and have invested \$53 million dollars.⁷ **As of 2017, 22.1% of high schoolers in NC smoke e-cigs, with \$0 invested.**⁷

Figure 3
Tax-Funded E-Cigarette Youth Prevention Programs



On the federal level, the Food and Drug Administration (FDA) has recognized the issue as an “epidemic” and are diverting federal funds and efforts to combat the growing usage of e-cigarettes in children under 18.⁸

“I use the word epidemic with great care. E-cigs have become a [dangerous] trend among teens. The disturbing and accelerating trajectory of use [must end]. It’s simply not tolerable...The FDA won’t tolerate a whole generation of young people becoming addicted to nicotine.” -FDA Commissioner, Scott Gottlieb⁸

Is this addiction building addiction?

Surveys by Grana have revealed that one-third of adolescents who smoke e-cigarettes have never even tried conventional smoking.² Moreover, Campbell-Heider discovered a common trend: smoking e-cigarettes often leads to conventional smoking.⁹ Therefore, rather than conventional smokers switching to a “healthier” option, studies are finding that e-cigarette smokers are digressing to conventional cigarettes.⁹ Primack has further studied this trend and has concluded that, **if you “vape” (smoke e-cigs), you are “four times more likely” to start smoking cigarettes.**¹⁰ Therefore, adolescents are not only risking their health when smoking e-cigs; they are *quadrupling* their chances of starting a second addictive, harmful habit. Despite this, the federal regulations still do not restrict the marketing of e-cigarettes on radio and television, the flavoring of nicotine, or the use of e-cigarettes inside public spaces; however, the startling jump in youth usage in 2018 has prompted proposed steps by the FDA to restrict youth access to e-cig flavorings and advertisements.^{11,18}

Do these initiatives make a difference?

Research has empirically linked antismoking campaigns targeted at youth to “substantial declines in youth smoking.”¹² As Farrelly discusses, the first anti-smoking campaign that directly targeted use among the nation’s youth was linked to 22% of the decline in use among students in grades 8, 10, and 12.¹² Specifically, the “hard-hitting ads” that portrayed young actors rejecting tobacco appeared to be the most “effective.”¹² **Thus, NC is able to implement an impactful anti-smoking campaign and should include these “hard-hitting” ads in any initiatives.**

How will this save NC money?

These public health initiatives will require funding from the state taxpayers.¹⁵ However, these programs do offer long-term monetary benefits based off of the studied economic incentives for reducing a population’s smoking habits.¹³ These economic incentives, as described by Fisherman, are the decreased “net societal costs” related to the lower average health costs for a population that has reduced tobacco use.¹³ Therefore, while it will cost the North Carolina government money to invest into the anti-electronic smoking campaigns, the programs are working under Fisherman’s conclusion that these campaigns are **“a relatively small investment” that “generates substantial cost savings.”¹³** Consequently, why the recency of these programs offer little research on the outcomes, Fisherman’s research concludes they will provide a return on the invested tax-dollars by incorporating what was successful with conventional smoking public health campaigns (e.g. awareness ads, school outreach).¹³

Therefore, to combat the harmful, costly acceleration of e-cig use, North Carolina should invest in e-cig prevention programs that target the state’s adolescents by supporting N.C. H.B. 276¹⁵

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