Chapter 6
Tobacco Avoidance: Defusing the E-Cigarette Explosion

How the epidemic of youth vaping happened and how health education can mitigate it

Q: What could possibly go wrong if we don’t take K—12 health education seriously?

A: The youth vaping epidemic.

As of the summer of 2020, the crisis of youth electronic-cigarette use, or vaping, is still in full flame. Though a full post-mortem is premature, we are far enough along to examine how it started, and consider the role health education could have played in limiting its spread and can still play in its eventual control and decline.

Where We Are and Why That’s a Problem

The Food and Drug Administration’s (FDA) and CDC’s annual National Youth Tobacco Survey concluded that in 2019, 5.4 million middle and high schoolers “currently” used e-cigarettes (i.e., during the past 30 days). That’s a staggering 2-1/2-fold increase from 2017.

The health dangers to kids of typical e-cigarettes include addiction to nicotine, potential harm to brain development, and the unknown long-term health impacts of inhaling the other chemicals the product contains. I say “typical” because for a while, e-cigarettes and vaping were synonymous mainly with the delivery of nicotine, but the devices and their use have come to encompass inhaling controlled substances such as THC and CBD along with many other chemicals that can be aerosolized. So, although vaping is really a behavior and not a specific drug, we will focus here on nicotine since most school-age vapers use mass-market e-cigarettes that contain it (including all JUULs, their favorite brand until recent changes in law described below).

Nicotine is uniquely dangerous to youth because the further a child’s brain is from
reaching full development at around age 26, the more susceptible that child is to becoming addicted to it – almost 90 percent of adult tobacco users took up the habit by age 18, and 99 percent by age 26.2 (This fact should make everyone skeptical of claims from the nicotine-delivery industry that they don’t want youth using their products. Without addicting youth, simple math tells us that their business can’t continue beyond a generation or two.)

In addition to being addictive, the Surgeon General’s Advisory on E-cigarette Use Among Youth warns that nicotine can cause reduced impulse control, mood disorders, and attention and cognition deficits in youth.3 Would any parents or teachers like to have their teens use a product that would give them lower impulse control, more mood disorders, and less attention and cognition?

Vaping also carries several other social, educational, and health risks for youth:

1. Youth who vape are four times more likely to start smoking cigarettes within 18 months than those who don’t.4

2. People addicted to nicotine are more likely to become addicted to other drugs, both illicit and prescription.3,5

3. Manufactured e-cigarettes contain many chemical compounds with unknown short- and long-term health effects. Perhaps worse, refillable vaping devices have inspired home-brew experimentation that is minimally regulated—besides nicotine, youth vape THC, CBD, and other concoctions. An outbreak of E-cigarette and Vaping Associated Lung Injury (EVALI) in late 2019 harmed more than 2,800 people and was ultimately traced to Vitamin E acetate, a thickening agent added to vaping products containing THC.6 EVALI may be only the first of many vaping-related diseases to come.

4. Although vaping is less expensive than smoking, it is still not cheap. (At 2020 prices, a $4.00 JUUL pod contains the same amount of nicotine as a pack of cigarettes, which costs an average of $7.00.) This expense may distort youth behavior and lead to crime. An Austin-area high schooler was murdered in
2019 in a presumed vaping sale stick-up, and teens are routinely caught shoplifting e-cigarette pods and devices, sometimes leading to a criminal record for life.

5. The more normalized youth vaping becomes, the greater the negative social consequences for those who don’t participate, including bullying and exclusion.

6. Importantly to the value to schools of teaching health, vaping is a giant distraction from education because kids leave class to feed their addiction, sneak a hit right in the classroom when the teacher isn’t looking, miss school due to suspension, or are otherwise unable to properly concentrate on learning.

How We Got Here: Supply Side

Considering the well-known dangers of tobacco and the hard-won social norms disfavoring its use, how is it possible that it could be so quickly repackaged and revisited upon our youth with such grotesque success?

A proper answer to this question must address both the supply side (the product and its availability) and the demand side (how youth feel about its use).

E-cigarettes were introduced around 2007 as a potentially safer alternative to cigarettes. Like smoking cigarettes, e-cigarette use involves inhaling a handheld device to deliver nicotine through the lungs and into the bloodstream. And because nicotine comes from the tobacco plant, e-cigarettes are considered tobacco products. However, whereas smoking involves combustion of tobacco leaves and therefore inhalation of the many carcinogenic by-products of burning them, using e-cigarettes involves heating a nicotine-containing fluid into a “vapor” or aerosol which is probably less harmful than tobacco smoke.

E-cigarettes have evolved into three product categories, each of which has different effects on and appeals to youth.
1. **Disposables.** These were the first e-cigarettes on the market and are typically of the same size and shape as traditional cigarettes. Initially they were not offered in exotic flavors and their appeal was mostly limited to adults trying to reduce the harm of their nicotine use while still having an experience similar to smoking. (Youth dismissed them as being “for old people.”) Following the 2020 rules limiting flavors of pre-filled e-cigarettes (see below), many flavored disposables have appeared and youth have been drawn in.

2. **Refillables.** Also known as “pens,” “tanks,” or “mods,” these e-cigarettes are larger and usually held in the palm of the hand instead of between two fingers. As their name suggests, these devices allow repeated use with “e-juice” (the suspension of nicotine in an easily aerosolized propellant) from your friendly and lightly regulated neighborhood vape shop. The availability of these devices has led to a proliferation of vape flavors: hot cinnamon, sour apple, crème brûlée, Dr. Pepper, cotton candy, pancakes and maple syrup, spearmint, T-bone steak, unicorn vomit (no kidding, Google it) — or if none of those sound tempting enough, any one of about 8,000 other delicious varieties. These products first gained popularity with young adults and were generally too expensive, cumbersome, and messy to take off with middle- and high-schoolers (who labeled them “douche flutes”). The biggest niche for these devices in the youth market today is for vaping THC or CBD.

3. **Pre-filled.** This type of device contains a snap-in “cartridge” or “pod” with flavored e-juice. The most notable example is JUUL, which burst on the scene in 2017 and in less than three years vastly expanded the under-18 market for vaping and captured 75 percent of it. Sometimes called the “iPhone of e-cigarettes,” JUUL resembles a flash drive and is thus both sleeker and easier to conceal than other devices. With a smaller range of flavors and pre-filled pods, its simpler packaging made it much easier to stock and sell than other types of vaping devices.

Many teens were suddenly able to get e-cigarettes by faking their age and ordering online, finding a corner store or gas station with lax age enforcement, or locating
an enterprising friend who had bought in quantity (legally or illegally) and would resell to them. Finally, JUUL’s breakthrough in using “nicotine salts” allowed it to make a higher-nicotine product, which it trumpeted delivered nicotine to the brain 1.25 to 2.7 times faster than other e-cigarettes. JUUL’s innovative combination of being appealing, accessible, addictive, and discreet led to its adoption by millions of K-12 students around the country.

Regulatory Response

The vaping crisis has triggered a new era of tobacco regulation, though a fierce tug-of-war persists between those who point to the potential harm reduction of vaping compared with using other tobacco products and those who point to the soaring use of vaping products among youth and their known and unknown health risks.

To address the youth accessibility side of the equation, on December 20, 2019, President Trump signed a law setting the minimum age to purchase any tobacco product at 21 years old. This change followed decades of advocacy and was undoubtedly spurred by the escalation of youth vaping and the enactment of similar laws in 19 states, including six of the seven most populous, in the years leading up to it.

In terms of youth appeal, many public health advocates have raised alarms that 81 percent of youth ages 12-17 report that their first experience with tobacco was with a flavored product (possibly because flavors mask the natural bitterness of nicotine and thus lower the barrier to initiation). It seemed clear that despite e-cigarettes’ promise of harm reduction to existing tobacco users, their exotic flavoring was attracting youth newcomers who were not already using it.

Thus, in September 2019, the Trump administration suggested a “flavor ban” on all e-cigarettes. After several months of intense lobbying by the vaping industry, the new rules that took effect in February 2020 only limit flavors in “pre-filled” cartridge devices. Menthol and tobacco flavors are exempt from restrictions across all devices. Initial reports suggest that since the change, youth e-cigarette use has simply shifted to
the other two device types (disposables and tanks), which have no flavor restrictions.

Other innovations have quickly sprung up as well. For example, Puff Krush, whose marketers describe it as “pre-filled [flavor] pods designed to be an add-on for the [tobacco] JUUL pod.” Krush pods are exempt from regulation because they contain no nicotine. So, by simply separating the nicotine and the flavoring into two different packages, manufacturers have circumvented the regulations in less time than it took to make them. In summary, flavor ban not a flavor ban.

How We Got Here: Demand Side

Since it takes two to tango, we also need to consider why today’s youth have been so uniquely susceptible to vaping.

First, their teachers and parents didn’t grow up with JUULs or other e-cigarettes and simply don’t have the life experience, facts, or vocabulary at hand to confidently discuss and bust myths about them. (What life experience we parents do have strongly argues for not taking up topics with our teens that we have not mastered ourselves!) So, most young people have not received the basic social inoculation against the dangers of e-cigarettes that they have for traditional cigarettes, marijuana, other drugs, drunk driving, unprotected sex, and other common youth health risks.

The yawning generational knowledge gap was unmistakable for me when I brought a JUUL to the largest annual gathering of high-school future health professionals (HOSA, formerly Health Occupations Students of America) in Dallas in the summer of 2018, after this product had already been around for a while. Of the hundreds of adults I presented to, only two or three hands went up when I asked what it was. Meanwhile, my colleagues and I were unsuccessful in finding a single high schooler with any such uncertainty, and collected a few classic “Duh!” looks along the way.

The second compounding element of this perfect storm was the advent of social media and micro-marketing, which allowed kids to be targeted with messages their parents weren’t seeing at all. If e-cigarette makers had taken out ads in TIME magazine like tobacco peddlers of yore, adults would have cottoned to the dangers quickly and the
A period of parental cluelessness about vaping would have been much shorter. Instead, e-cigarette manufacturers, especially JUUL, exploited channels unmonitored by grown-ups through the use of paid social media “influencers” on Twitter, Instagram, and YouTube. These influencers’ posts portray the product as cool and evoke emotions such as relaxation, freedom, and sex appeal. Often including images of youth, they easily reached underage consumers.

A third reason that parents and teachers were caught unawares is, ironically, that youth smoking prevention policies and programs—including hard-hitting youth awareness media campaigns like those from the non-profit Truth Initiative—were so successful. From the mid-1990s to 2018, the portion of eighth-to-twelfth graders smoking cigarettes on a daily basis plunged 88 percent.12 Perhaps it is only natural that parents and schools shifted their attention away from teen nicotine use. But in so doing, we left our kids unguarded from the predations of Big Tobacco and e-cigarette upstarts like JUUL. And when they hit, those decades of neglect of health education meant schools were without the staff skill, schedule time, parent engagement, and culture of teaching health needed to mount a rapid response.

How Health Education Can Help

The dizzying rise of youth vaping shows that when it comes to health education, parents can’t keep up and, because they don’t make it a core priority, schools don’t keep up.

Skills-based health education that applies Social Cognitive Theory and Social and Emotional Learning could have helped stop the march of vaping, and still can, in three ways.

The first is by **disseminating knowledge** through posters and other environmental supports in schools, as well as through classroom education that includes accountability measured through assignments and tests. Just because youth are familiar with vaping does not mean they understand it, and in the absence of formal or at least parental health education, teens bear the weight of dangerous myths passed
peer-to-peer. For example, 59 percent of youth think e-juice is mostly water (it actually has none) and 41 percent think that if e-cigarettes are flavored, it means they don’t contain nicotine (99 percent of mass-market products and all JUULs actually do).\textsuperscript{13,14} This latter myth was passively stoked by the industry, which did not clearly label their products as containing nicotine until required to do so in August 2018.\textsuperscript{15} In an illustration of our youth’s own anger at the lack of information about vaping available to them, a number of youth-initiated lawsuits have been mounted alleging that manufacturers intentionally deceived the public about e-cigarettes’ nicotine content.

The second benefit health education could provide is to cultivate healthy attitudes and beliefs about e-cigarettes. Many youths, to some extent abetted by adults, have underrated the dangers of vaping due to whatever is the opposite of “guilt by association” with cigarettes. Let’s call it “innocence by dissociation.” School-age youth mostly still harbor social antibodies against smoking combustible tobacco but see vaping as fundamentally different, rather than as the same old drug (nicotine) delivered in a different package. No wonder, since e-cigarettes have been promoted as a potentially safer alternative to cigarettes. (JUUL illegally said “safer” for a while, and in September 2019 received a harsh cease-and-desist letter from the FDA on that subject.\textsuperscript{16})

Anyway, “potentially safer” is hardly consolation when you are comparing something with an unquantified risk with one of the deadliest products of all time. When used as designed, cigarettes have already caused 100 million deaths and add another one hundred planeloads of fatalities every day.\textsuperscript{17} And there’s certainly no need for a “safer alternative” for the millions of kids who never smoked in the first place! A good health teacher can guide youth to reframe unhealthy beliefs (for example, changing “this is safer” to “safer is not safe”), and in so doing significantly improve health behaviors.

Finally, health education can combat demand for vaping through youth empowerment. It’s pretty clear that the dogmatic “just say no” approach never
worked, and it certainly doesn’t work with today’s teens. Instead, teachers need to help kids to make their own decisions about their health behaviors and arm them with the social skills to back them up. For example:

1. Instead of asking students to make a “pledge” not to vape, ask them to make a “choice” about vaping. Pledges can feel coerced and, like forced apologies, may not be sincere. Making a choice is much more empowering.

2. Rather than making declarative statements, ask open-ended questions about how vaping could hinder kids’ own goals. This helps kids reflect and formulate connections in their own minds between their behaviors and the short and long-term consequences of those actions.

3. As part of the health curriculum, organize peer-led small-group discussions and report-outs facilitated by peer-elected leaders. This format helps youth hear health messages in their peers’ own words and promotes participation and candor.

4. Guide youth in naming and practicing peer refusal skills. Rehearsing refusal is crucial because the moment when (not if) a child is offered an e-cigarette may well be in a socially charged atmosphere where there is little time to formulate a confident reply.

5. Provide project-based learning opportunities for teens to explain, share, and advocate publicly for their healthy choice through presentations, posters, PSA videos, and social media. This evangelism will help cement their decision and beliefs into their own identity, while potentially persuading some of their peers to follow their lead (see Case Study 1).

These techniques help develop healthy attitudes and empowering skills, particularly important in combatting the billions of dollars in advertising poured into making vaping look cool. If health educators are going to help kids replace marketers’ hollow emotional appeals with an attitude that it’s health that is cool, a facts-only, adult-delivered approach will not work. The strongest and most durable health behaviors are the ones cultivated by training youth to think and act for themselves.
Pitfalls to Avoid

In addition to following these best practices, schools that want to make an impact on student vaping through health education will need to break a few bad habits.

First, resist the temptation to plug the topic of vaping into an already weak approach to school health education. Schools need to acknowledge when they’re behind and actively remediate the problem. I have attended several presentations for parents in which a school triumphantly announced that vaping will be added as a topic in the (one-and-done) sixth-grade health class next year! Invariably, an irate parent will raise their hand and say, “What about my seventh grader who will be in eighth grade next year—what are you doing for them?” And if no one is saying it, they’re still thinking it. If you are the one fielding that question, how will you reply?

Second, don’t limit vaping education to students who are caught in the act. Quality youth health education programs reform some kids, but their strength is in prevention, not cessation. And for a bona fide addict, the remedy may need to go beyond education to behavioral and/or drug therapy.

Moreover, making health education a punishment is a bad precedent and a huge disservice to kids who, with a dose of prevention, might have avoided an infraction in the first place. Assigning kids a community-service project like making an anti-vaping poster or video may be an instructive disciplinary “learning experience,” but it’s no substitute for making vaping prevention part of the educational core.

And finally, don’t let up when this particular crisis passes. To be a good educator means staying at the forefront of public health trends, and the vaping epidemic has amply illustrated that health education topics and techniques evolve at least as fast as those of any other subject. Health needs to be made a part of schools’ educational core once and for all so that when the next threat emerges, we are in front of it rather than playing catch-up with a generation of children.

Summary
The epidemic of youth vaping was caused by the combination of rapidly evolving and poorly regulated repackaging of nicotine (supply side) and a vacuum of adult awareness and school health education (demand side). Educationally sound and up-to-date approaches to health behavior skill-building and youth empowerment have been shown to help reduce vaping among K—12 students, but to make meaningful progress more schools need to reform poor health education habits.

**Recommended Actions**

Teachers and Parents of School-Age Children: Inform yourself about vaping basics and ask your child’s school how they are addressing the epidemic.

Principals: Provide youth vaping prevention education proactively, rather than as a disciplinary response. Host a required informational session for staff and an optional one for parents.

School Boards, Superintendents, and District Administrators: Require evidence-based vaping prevention education for all students in grades 5-12. (Although some experts advocate starting even sooner, others claim that can backfire by kindling curiosity.) View the vaping epidemic as a symptom of a chronic lack of health education in schools, not an isolated problem to be overcome and forgotten.

**Notes**


3. Office of the Surgeon General. *E-cigarette Use among Youth and Young Adults*:.


11. “PUFF Krush Add-On Pre-Filled Vape Pods 24 pk,” Indigo Distribution,


