**THE ANATOMY OF THE VAPING EPIDEMIC**

Perspective is everything. As a teenager, you may have friends and peers that have fallen victim to vaping. As a parent, it is possible your knowledge of e-cigarettes is little to none – to the point where you are not suspecting your child’s habit under the same roof. You may think that your friends, peers, or children are “too good” to vape; but this problem has, unfortunately, spread to every corner of the United States. E-cigarette use or vaping is a relatively new phenomenon with disproportionate popularity amongst youth and young adults compared to other age groups in the United States. Data from 2019 indicates more than 5 million US youth reported vaping during the past month and approximately 1 million admitted vaping every day.1 This equates to 1 in every 4 high school students, and 1 in every 10 middle schoolers.2 In fact, E-cigarette use is currently the most common form of tobacco used by teens in the United States.2 This problem has become particularly evident during the past decade with an exponential rise in vaping among youth (2.1% in 2011 to 38% in 2019).1,2 This alarming trend prompted the US Surgeon General to declare vaping an “epidemic” in December 2018.3 Inevitably, this epidemic has also infiltrated my community by affecting those around me: even friends and peers I grew up with. Despite the completion of the *DARE* program and our 5th grade pledges to resist peer pressure and reject harmful substances, I have witnessed many of my classmates succumb to peer pressure, start vaping, and use their money to support their habit in and out of the school environment.

Marketing influences perspective. Big Tobacco strategically packages, advertises, and promotes tobacco use in various forms. Research shows most chronic users of tobacco products started their habit at a young age. The youth have always been the prime target for Big Tobacco; if the tobacco industry can get young people hooked, they will secure life-long customers for their products. That is the Big Tobacco blueprint. With the decline in use and appeal of traditional cigarettes among the younger generation in recent years, Big Tobacco had to re-invent itself to maintain its bottom line: profiting at any cost. It upgraded its marketing strategies and used venues such as concerts, celebrities, social media, discounts, and giveaways to communicate subtle, subliminal messages to its young audience. It cloaked the “same old thing” and promoted vaping as a chic, enjoyable, and a safer alternative to smoking. Tobacco giants shamelessly used kid-friendly flavors to lure teenagers into trying their designer poison. In one study, 43% of middle and high school students reported appealing flavors as the main reason for trying E-cigarettes.4 What could banana nut bread, gummy bear, mint, or mango flavored E-juice be labelled as anything other than a tasty toxin?

Nicotine is the silent attraction vapers did not sign up for. Despite the overwhelming messaging by Big Tobacco, vaping is not a harmless habit or healthy alternative to smoking. The human brain is not fully developed until the age 25 and adolescents are especially vulnerable to the harms of vaping.1,5 Exposure of the developing brain to nicotine impacts attention and learning, lowers impulse control, and increases the risk of mood disorders.1,5, 6 Nicotine is highly addictive, with an addiction potential second only to heroin and cocaine. 7 The likelihood of experimenting with traditional cigarettes is three times higher in youth who vape than those who do not.4 Evidence also suggests that vaping may serve as a gateway for use of other drugs.4, 8  Nicotine also has cardiovascular effects: it raises heart rate and blood pressure, therefore putting vapers at increased risk for chest pain and heart attack.9,10 Nicotine is present in almost all vaping products,4 although many teenage users do not realize it. In fact, JUUL, a popular brand of E-cigarettes among youth, deliver much higher nicotine levels than regular cigarettes.1 Surprisingly, nearly 2/3 of young JUUL users did not even know it contained nicotine.4 This is partially a byproduct of the poor regulation of the vaping industry, and Big Tobacco’s deceptive marketing. This misinformation campaign is so well designed that many teens are convinced they are vaping water vapor rather than nicotine. This lack of awareness is not limited to our youth. In New Jersey, the sale of nicotine products to those under the age of 21 is prohibited; however, many teens find a way to get their hands-on vaping pods & devices. In fact, some parents perceive nicotine delivery devices as harmless as candy and purchase them for their children without a second thought. Sadly, a product initially promoted, though without clear evidence, as a tobacco cessation aid for those interested in quitting cigarettes has been repurposed as an initiation product for teenagers.

No vape is safe— not even the few which don’t contain nicotine. The vaping industry is poorly regulated and multiple chemicals such as heavy metals, free radicals, and even carcinogens have been found in the E-liquids and the vaping aerosols.4 The inhalation of E-cigarette aerosols harms the mouth and throat, causes cough and wheezing, and worsens asthma.9 In a recent study, adults with no previous lung conditions had a 30% increase in the risk of asthma and emphysema after 3 years of using E-cigarettes.11 Popcorn lung is an irreversible scarring lung condition causing cough, wheezing, and shortness of breath. Popcorn lung has been linked to the inhalation of diacetyl compounds, which is present in many flavored E-cigarettes and ultimately puts vapers at risk for this condition. 12

Last summer, there were numerous reports of E-cigarette/vaping-associated lung injuries (EVALI), including fatalities, throughout the US.13 Many victims had one thing in common: they had vaped E-liquid containing marijuana and vitamin E-acetate additives. Even during the current pandemic, there is evidence that youth vapers, because of their chronic lung damage, are not only five times more likely to contract COVID-19, 14 but also are at a greater risk for severe complications if infected.15 Vaping could also affect other organs in the body, including the stomach, causing nausea and other severe symptoms.8 Finally, there have been numerous incidents of vaping device explosions that caused burns, severe bodily damage, and fatalities.16 The potential health hazards of vaping aerosols does not spare bystanders who inhale the fumes exhaled by vapers.17 In 2018, one third of middle and high school students were passively exposed to vaping aerosols generated by others.17 This raises a serious concern about the health effects of second-hand vaping in vulnerable children and teens, especially those exposed to vaping aerosols in the school environment.

As a member of Bergen County’s Youth Tobacco Action Group, I have learned much about the vaping epidemic and its prevalence in my state. According to the 2016 NJ Youth Tobacco Survey, the most common tobacco product ever tried (21.0%) and currently used (9.6%) by public high school students was E-cigarettes.18 This has made me more perceptive of the ill impact of this epidemic on youth who capitulated to false messaging from their peers that vaping is “in”, “fun”, and “safe”, because they did not know what I know. In a recent survey of youth in Bergen County, New Jersey about alcohol and drug use, over 90% of respondents were high school students. 19 The survey showed that 47.9% of respondents reported their peers were addicted to vaping, and 84.2% of them indicated the source of vape products for their peers were friends.19 For many teenagers, being in high school can be difficult to navigate. Teens often do not have the tools to deal with the constant stress of schoolwork, extracurriculars, sports, and social cliques. Teenagers were never taught how to properly manage their emotions and release stress in a healthy way and therefore, may opt for an alternative fix by vaping. They use E-cigarettes to get a “buzz”, cope with their anxiety, feel satisfied, or socialize with peers.

Many teens do not connect vaping with smoking cigarettes, and are unaware that vaping one JUUL pod is equivalent to smoking twenty cigarettes. Teenagers enjoy a buzz, or feeling of relief, when using a tobacco product for the first time.20 This is because nicotine binds to brain receptors and affects one’s mood, focus, and relaxation. This temporary buzz, however, comes with the heavy price of addiction to nicotine. With the continued use of nicotine products, there is a change in brain chemistry and an increase in the number of nicotine receptors.20 This explains the intense craving vapers feel soon after the effects of their last nicotine hit has worn off. Over time, users will be caught in a vicious cycle— they will need to intake even more nicotine to overcome their tolerance, experience the desired buzz, and avoid the anxiety triggered when their nicotine hit is delayed.20

Unfortunately, teens who vape soon realize that reprogramming your addicted brain takes time, and it is extremely difficult to go cold-turkey without serious withdrawal symptoms. These include sweating, nausea, abdominal cramping, headaches, insomnia, irritability, anxiety, depression, and many other unpleasant symptoms. Withdrawal symptoms can start as early as 30 minutes after using a nicotine product.21 The heavier one’s dependence on nicotine is, the more severe the withdrawal symptoms and the more intense the craving for nicotine are. This battle for freedom from nicotine can take weeks to months, until discontinuing the use of nicotine products leads to the regression of brain nicotine receptors.20, 21 In other words, it is much easier/faster to get addicted to nicotine than to wean off of it. Having developed heavy dependence on E-cigarettes, most youth who vape either do not see or do not mind Big Tobacco’s covert push of vaping on the younger generation and the hazard to their health and wallet.

The aforementioned harms of vaping are merely the tip of the iceberg. Despite its tremendous popularity, vaping is a fairly new trend with many long-term effects still unknown. This is not too far-fetched. We learned about the deadly effects of smoking years after celebrities endorsed their favorite brands. Unfortunately, by the time we discover vaping may be our generation’s version of cigarettes, it may be too late. We need to act now at many levels by:

- Regulating the tobacco industry and eliminating loopholes

- Exposing the greed, influence, and marketing ploys of Big Tobacco

- Raising awareness of teens about the real cost of vaping

- Empowering youth on how to cope with peer & societal pressures through self-care

- Making cessation resources available to teens and assisting them on the road to recovery

As responsible citizens of a nation affected by the vaping epidemic, each one of us can answer this call-to-action in our own individual way. My call-to-action is to expose Big Tobacco, educate my peers, and empower them to make better choices. Here is why:

We all agree that tighter governmental regulation and reinforcement in matters such as advertising, availability of kid-friendly flavored products, or their sale to minors are fundamental public health strategies for curbing the rise in vaping among teens. The Federal Drug Administration (FDA) has been well aware of the nationwide vaping epidemic and has been working to address this growing problem. However, due to a variety of reasons, change has been slow to come. Nevertheless, one thing to keep in mind is that Big Tobacco is just as persistent in re-packaging its products as youth are resourceful in obtaining them. In response to the alarming rise in vaping driven by youth-appealing flavors, the FDA finally banned the sale of flavored cartridge-based E-cigarettes in January 2020. Despite the improvement in regulations, the limited nature of this new policy permitted the sale of disposable flavored devices, which were exempt from the ban.22 This prompted many teenagers to switch from closed pod devices, such as JUUL, to disposable flavored E-cigarettes, such as Puff Bar. Once again, Big Tobacco was able to maintain its bottom line. In July 2020, the FDA ordered companies to remove disposable flavored products from the market. The outcome of this ruling remains to be seen because some of these products are still available for purchase on the web or may be marketed under a different brand in the future.

In my opinion, we need to adopt upstream solutions to the vaping epidemic. During the current pandemic, we are taking all the necessary precautions, such as wearing a mask or social distancing, to avoid contracting COVID-19. These measures are proven to work in the short-term, but the long-term solution is to develop a vaccine (to prevent the virus from spreading) or a medication (to treat the virus). Inoculating youth with information is like vaccinating them against vaping, irrespective of the product availability, industry’s marketing practices, and regulatory loopholes. A youth-initiated awareness project focused on the real cost of vaping, covert push of Big Tobacco and empowerment to resist peer pressure, is essential for connecting with teens in a way that will change their perspective. Currently, there is an abundance of information about vaping and its consequences available online or discussed during school-sponsored events. However, teenagers often ignore what is covered in the news or during health classes. Much like those who ignore the benefits of sheltering in place and wearing a facemask to prevent the spread of COVID-19, many teenagers are dismissive and do not relate the potential harms of vaping to their personal experience. For some teens, despite their perception of harm, vaping is a choice. Paradoxically, they fail to realize the nicotine will ultimately take away their freedom to choose.

I think an effective way to reach youth would be far from typical. To effectively relay our message, we need to be as smart— if not smarter— than Big Tobacco. This requires connecting with teenagers by not being judgmental whilst opening a truthful conversation about their habit. Peer-to-peer education is the messaging strategy, which resonates with youth and empowers them to resist peer and societal pressures by consciously following a different path. Furthermore, while it is important for teens to understand the harms of vaping, it is equally important to present them with healthy alternatives for socializing and coping mechanisms that they can lean on in times of stress. Teens could be encouraged to actively pursue a “natural buzz” which makes them feel good and helps them bond with peers but, unlike vaping, does not come with shackles. This sense of invigoration can come from a variety of healthy pursuits (painting, singing, dancing, swimming, playing a sport, etc.) and can be the ticket to a vape-free life for teens.

*My vaping awareness campaign addresses the weakest link in the vaping epidemic; because vaping is not a reflection of one’s character, it is merely a manifestation of one’s vulnerabilities.*

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