



Vaping Among Indiana Youth



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Executive Summary

The U.S. Surgeon General and other public health officials have described the use of e-cigarettes, or vaping, by young people as an epidemic. E-cigarettes are electronic devices that heat a liquid (called e-liquid) typically containing nicotine, flavoring, and other chemicals to produce an aerosol that is inhaled by a user. Although nicotine is the most common drug that young people vape, vaping marijuana is also increasing in popularity.

E-cigarettes come in a variety of shapes and sizes, the most popular being small, electronic devices that look like USB flash drives. Vaping among youth, particularly those in middle and high school, has seen a dramatic rise in the past two to three years. According to the Centers for Disease Control and Prevention (CDC), between 2017 and 2018, vaping increased by 78% among high school students and by 48% among middle school students. Additionally, national surveys report that the use of e-cigarettes to ingest marijuana has also seen a sharp increase among young people, particularly between 2018 and 2019. Public health officials attribute the dramatic increase in youth vaping to the introduction of JUUL. When first introduced to the market, JUUL contained a high-nicotine e-liquid that was available in several appealing flavors. Youth are drawn to e-cigarettes for a variety of reasons, including curiosity about the product, the wide range of youth-friendly flavors, peer influence, and youth-focused advertising.

Although the long-term health effects of vaping are not currently known, e-cigarettes do pose a number of risks to young people. First, the use of e-cigarettes serves as a gateway to future combustible cigarette use. Second, because most e-liquid contains nicotine and because the adolescent brain is particularly sensitive to nicotine, the use of e-cigarette products places young people at heightened risk for nicotine dependence. Third, the chemicals contained in e-liquid have never been approved by the Food and Drug Administration for inhalation. Flavoring agents and

the other chemicals which compose e-liquid have been associated with breathing difficulties and potentially serious lung damage as seen in the recent outbreak of vaping-related illness. Policy measures that can potentially curb vaping among young people include:

- Banning the sale of flavored e-liquids
- Putting restrictions on e-cigarettes which are in line with those for other tobacco products
- Placing a limit on how much nicotine e-liquids can contain
- Taxing e-cigarettes and e-liquids at the same rate as other tobacco products
- Strengthening smoke-free laws to include the use of e-cigarettes
- Implementing evidence-based public education and media campaigns

Introduction

According to the U.S. Surgeon General and other public health officials, e-cigarette use, or vaping¹ as it is widely known, has reached epidemic proportions among the nation's youth, resulting in an emerging public health crisis [1, 2]. Although e-cigarette manufacturers claim that their goal is to aid smokers quit the use of combustible cigarettes, their marketing strategies have targeted youth and young adults by tying their use to a hip, popular, and sexy lifestyle [3, 4]. Currently there are over 400 e-cigarette devices on the market and these devices have evolved over time [5]. Early models were designed to mimic the appearance of traditional cigarettes. More recent models may look like large pens with clear tanks that hold liquid, to boxes or other shapes, many of which allow the user to control temperature and amperage in order to customize the vaping experience [6, 7]. The newest e-cigarettes are relatively small, look like electronic devices such as flash drives, everyday items such as candy containers, or medical devices like asthma inhalers, allowing users to hide the fact that they are vaping [8].

Regardless of their shape, all vaping devices contain four basic parts: a battery, a heating coil, a reservoir to hold liquid (called e-liquid, e-juice, or vape juice), and a mouth piece

through which a person puffs. When activated, the device will heat the e-liquid creating what looks like vapor, but is actually an aerosol composed of ultrafine particles that users subsequently inhale [6, 9, 10]. E-liquid typically contains the following components: nicotine, flavoring, water, and carrier liquids such as propylene glycol or glycerol. The nicotine concentrations of e-liquids vary widely with some products containing from 1.0% to 2.0% nicotine to as much as 7.0% [11]. Although there are e-liquids marketed as being nicotine-free, some of these products have actually been found to contain traces of nicotine [12]. E-liquid comes in a variety of flavors ranging from tobacco, to fruit, candy, and alcohol, with fancy names such as "Unicorn Milk" or "Candy Man" that appear to target young people [13]. Over 7,000 flavors of e-liquid are currently available [14]. Although nicotine is the most commonly vaped substance, a growing number of youth are also using e-cigarettes to vape various forms of cannabis (THC) [6, 8, 15-20].

The purpose of this report is to help inform policymakers, public health workers, school administrators, community agency workers, and the general public about issues related to vaping among young people, and what policies may be effective in reducing it. The

¹The term vaping arose to describe e-cigarette use due to the clouds of what appear to be vapor that a person inhales and exhales while using an e-cigarette.

information presented in the brief comes from a review of current literature on vaping among youth, national and local-level surveys that collect data on vaping, and a series of key informant interviews with local public health officials, tobacco prevention workers, and other individuals working within organizations whose aims include reducing and preventing tobacco use among Hoosiers.

National Trends

National Youth Tobacco Survey (NYTS)

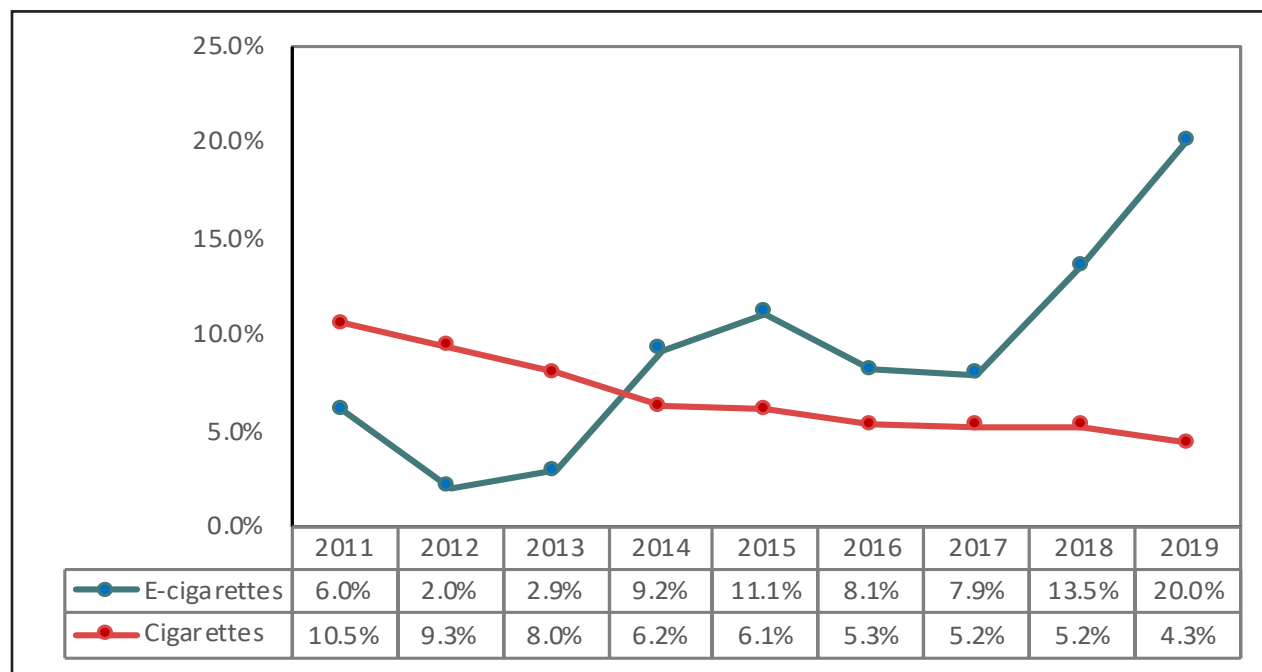
The National Youth Tobacco Survey (NYTS), administered by the Centers for Disease Control and Prevention (CDC), is an annual survey that tracks tobacco use among middle and high school students. The CDC began to collect data on vaping in 2011. Between 2011 and 2015 the NYTS documented a 900% increase in the number of middle and high school students who were currently using e-cigarettes. By 2014, e-cigarettes had surpassed combustible cigarettes as the most frequently used tobacco

product by U.S. youth [21]. From 2015 to 2017, e-cigarette use decreased; however, the period from 2017 to 2018 saw a jump in use of 78% among high school and 48% among middle school students, reaching a record high. The CDC estimated that during this same year, 3.6 million middle and high school students were currently using e-cigarettes, a 1.5 million increase from 2017. The current use of tobacco products increased from 2017 to 2018, by 38.3% among high school students and by 28.6% among middle school students. This increase was completely attributable to e-cigarettes [22, 23]. Results from the 2019 NYTS indicate that e-cigarette use continues to climb with 27.5% of high school and 10.5% of middle school students reporting current use (**see Figure 1**). Among e-cigarette users in 2019:

- 50.8% used between 1 to 5 days,
- 18.8% used between 6 to 19 days, and
- 30.4% said they used on at least 20 of the past 30 days [24].



Figure 1. Current use of e-cigarettes by U.S. middle and high school students (NYTS, 2011-2019)



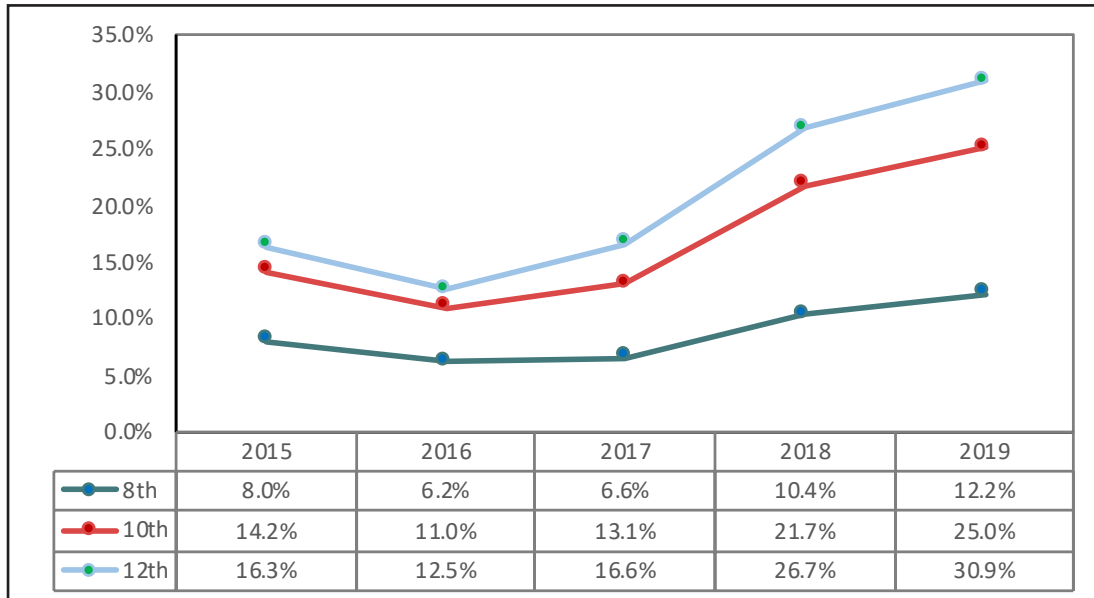
Source: Centers for Disease Control and Prevention, 2019

Monitoring the Future Survey (MtF)

The MtF tracks national trends in substance use among the nation’s 8th, 10th, and 12th graders. In 2015, the MtF began including questions on vaping. The MtF indicates that vaping decreased among all grade levels between 2015 and 2016. After 2016, however, the number of students currently vaping grew dramatically. In particular, the increase in e-cigarette use across all grade levels from 2017 to 2018 led the authors of the MtF to conclude that “the most important finding to emerge from the 2018 survey is the dramatic increase in vaping by adolescents.” The authors further noted that the change was the largest increase

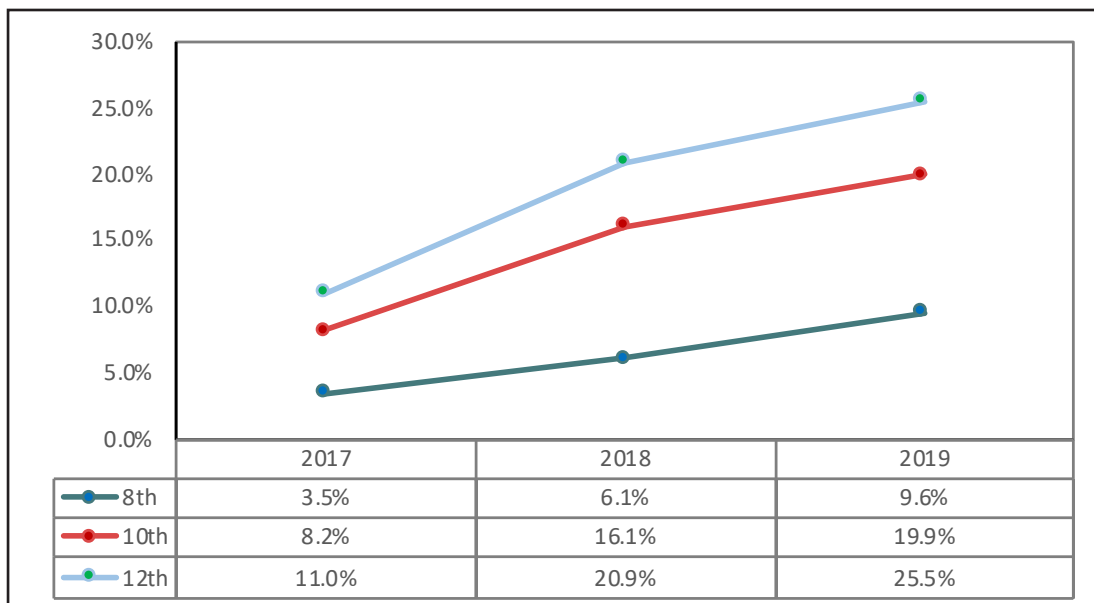
in any adolescent substance use outcome in the 43-year history of the survey [25]. More specifically, among 12th graders, nicotine vaping nearly doubled from 2017 to 2018, rising from 11.0% to 20.9%. Similar to findings from the NYTS, there was an overall increase in nicotine use among youth between 2017 and 2018. This increase was driven strictly by vaping as nicotine use other than vaping declined by 2.1% [25, 26]. Recently released data for 2019 show vaping is continuing its upward trend with approximately one in four 12th graders, one in five 10th graders, and one in ten 8th graders having vaped nicotine at least once in the past 30 days [18, 20, 27] (**see Figures 2 and 3**).

Figure 2. Current vaping of any substance by 8th, 10th, and 12th graders (MTF, 2015-2019)



Source: Miech, et al., 2019

Figure 3. Current vaping of nicotine by 8th, 10th, and 12th graders (MTF, 2017-2019)

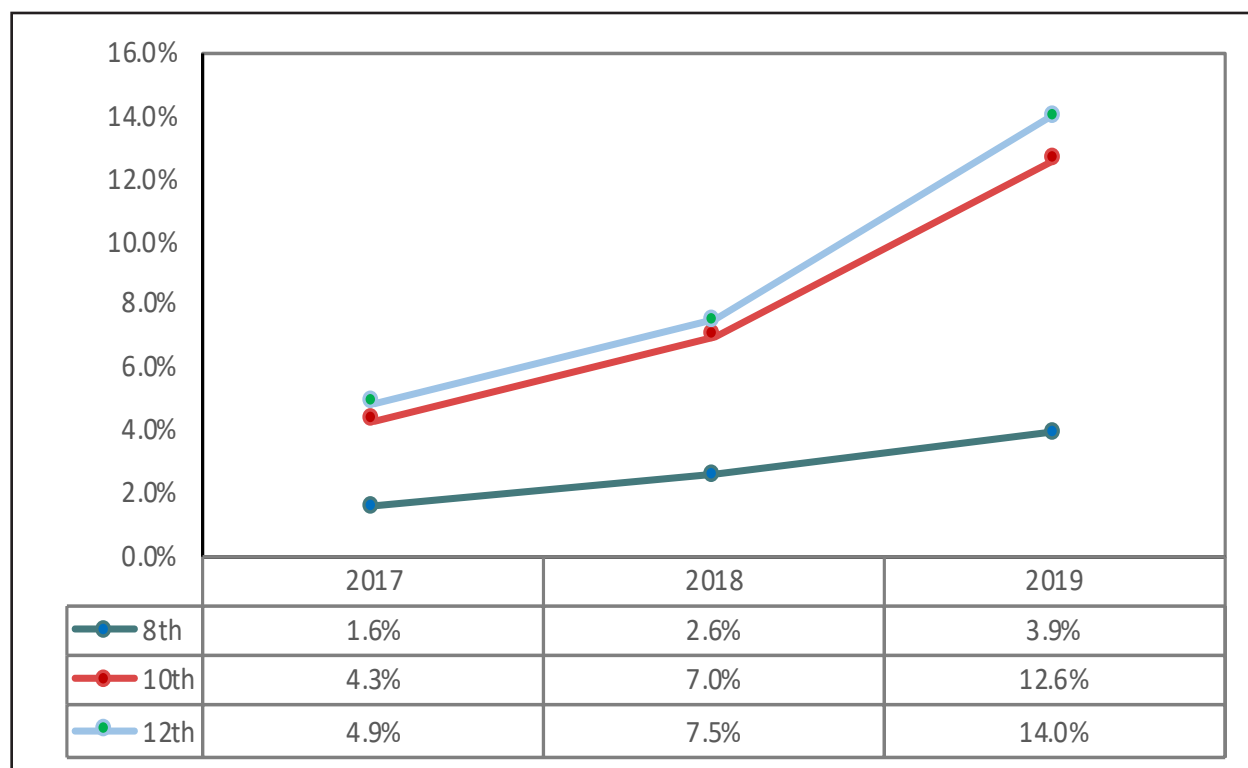


Source: Miech, et al., 2019

Vaping devices are increasingly being used to inhale THC most often in the form of hash oil or hash wax. E-cigarettes allow youth to use THC more discreetly as the aerosol from hash oil or hash wax produces little to no distinctive odor associated with combustible marijuana. Currently, the only source of data on THC vaping comes from the MTF. Since 2017, the survey has asked students to indicate if they vaped marijuana at least once in the past month. By

2019, the percentage of 8th, 10th, and 12th graders reporting current THC vaping had more than doubled. The sharpest increase in THC vaping occurred between 2018 and 2019, when vaping of THC by 12th graders rose by 87.0%. The authors of the MTF reported that this finding represents the second largest one-year jump ever seen for any substance use in the history of the survey [18, 20] (see Figure 4).

Figure 4. Current vaping of THC by 8th, 10th, and 12th graders (MTF, 2017-2019)



Source: Miech, et al., 2019

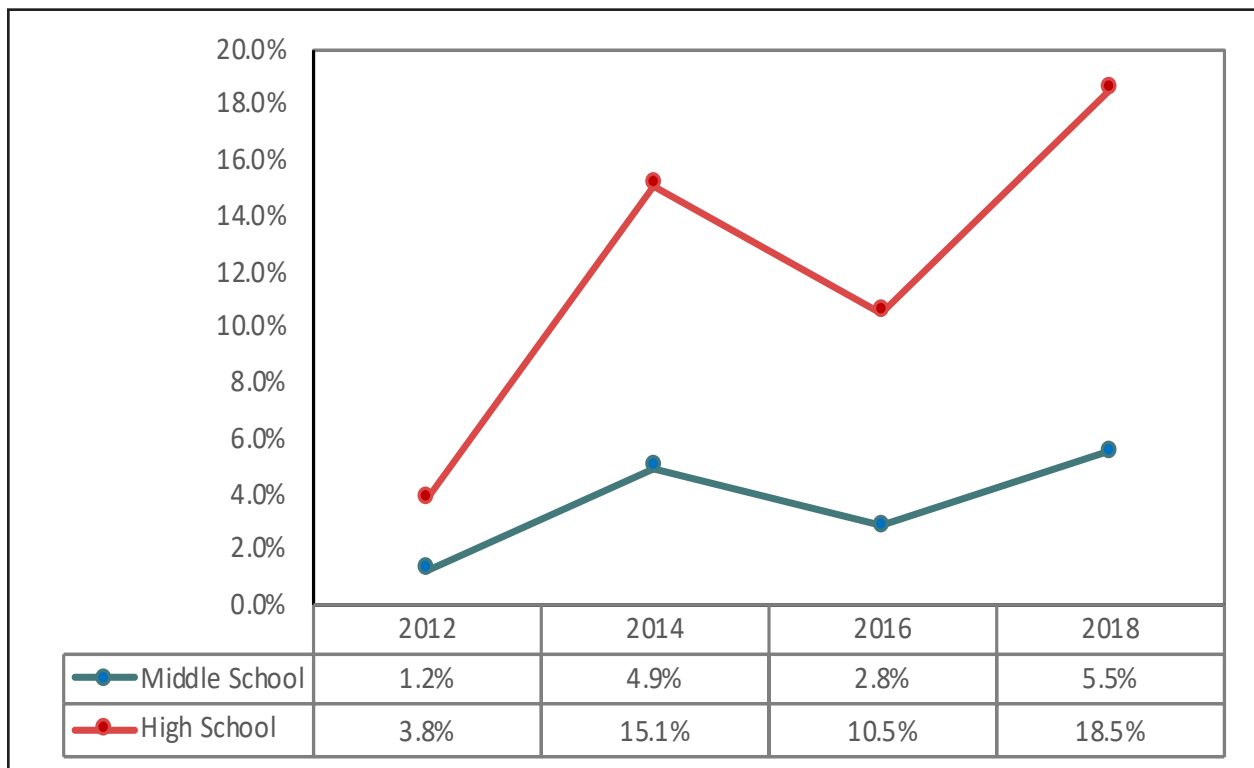
Indiana Trends

Indiana Youth Tobacco Survey (IYTS)

The Indiana Youth Tobacco Survey (IYTS), conducted biennially by the Tobacco Prevention and Cessation Commission, measures youth tobacco use, exposure, and attitudes. Since 2000, the use of most tobacco products has declined while the use of e-cigarettes has risen. Between 2012 and 2014, there was a four-fold increase in past-month use of e-cigarettes across both middle and high school students.

Though e-cigarette use declined in 2016, there was a significant increase in 2018. From 2016 to 2018, current e-cigarette use among high school and middle school students nearly doubled, representing about 35,000 additional Indiana youth who reported current use of e-cigarettes. E-cigarettes continue to be the most commonly used tobacco product among Hoosier youth [28] (see Figure 5).

Figure 5. Current use of e-cigarettes by middle and high school students (IYTS, 2012-2018)



Source: Indiana State Department of Health, 2019

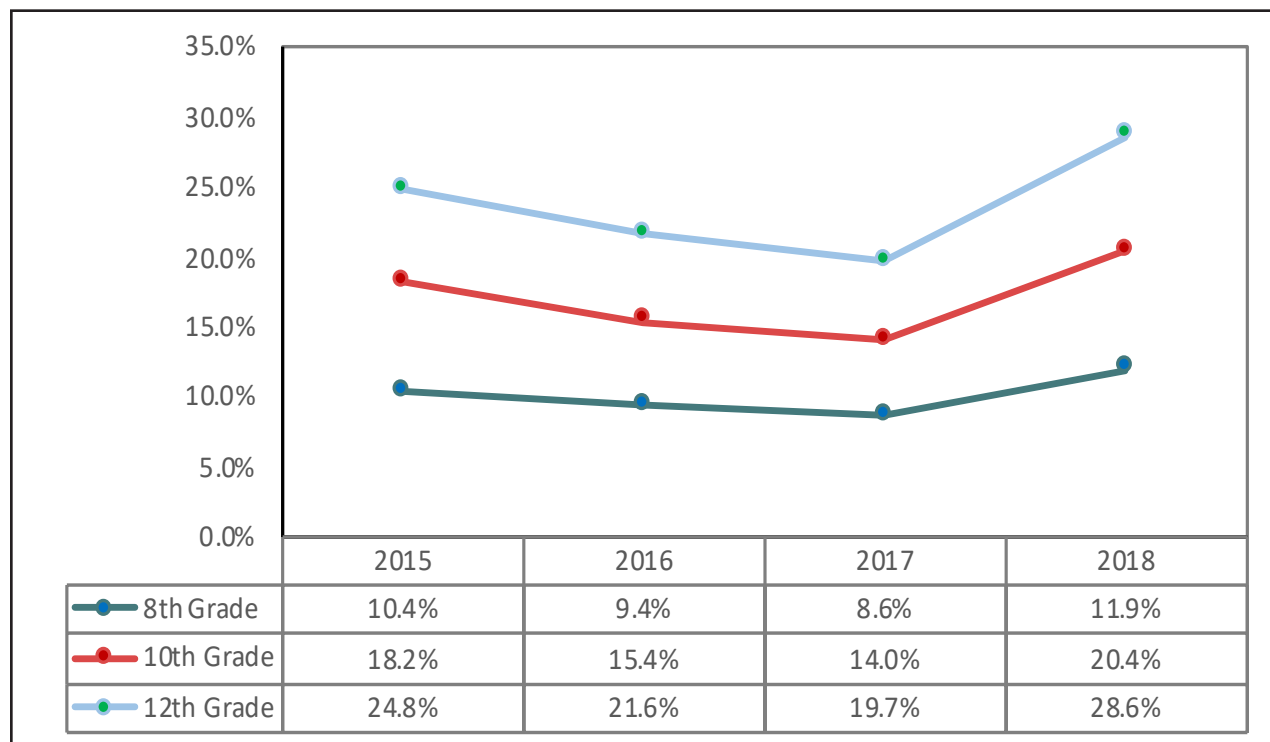
In 2018, the IYTS reported that among e-cigarette users, 29.4% of middle school and 38.6% of high school students said they had used their e-cigarette to vape some form of marijuana [28].

Indiana Youth Survey (INYS)

The Indiana Youth Survey (INYS) is a school-based survey, which asks students about use of alcohol, tobacco, and drugs. Since 2015, the INYS has included a question regarding past-month use of electronic vapor products. Similar to other surveys, the INYS shows a decline in

youth vaping between 2015 and 2017. From 2017 to 2018, however, youth vaping increased substantially. In 2018, approximately one in four 12th graders, one in five 10th graders, and one in ten 8th graders had used an electronic vapor product in the past 30 days. Overall, 16.9% of Hoosier students reported past-month e-cigarette use in 2018. The rate of e-cigarette use among Indiana students is nearly three times higher than that of the second most frequently used tobacco product, combustible cigarettes [29] (see Figure 6).

Figure 6. Current use of electronic vapor products by Indiana 8th, 10th, and 12th grade students (INYS, 2015-2018)



Source: Gassman, et al., 2018

Why do youth vape?

Curiosity

Young people are drawn to vaping for a number of reasons. Curiosity about a product that seems cool, fun, or new appears to be the primary motivation for young people to try e-cigarettes initially [30]. According to the 2019 NYTS, 55.3% of middle and high school students who ever tried an e-cigarette and 56.1% of current exclusive e-cigarette users said that the primary reason they tried e-cigarettes was out of curiosity [24]. These findings are consistent with the MtF and other studies of teen vaping behaviors [31-34].

Flavors

E-liquid flavors also appear to be a significant reason for use. Among youth who experiment with tobacco products, including e-cigarettes, over 80% start with a flavored product [35]. Data from the 2019 NYTS indicate that 69.6% of middle and high school students who currently use a tobacco product use at least one flavored product. The most commonly used flavored tobacco product were e-cigarettes. Of youth who used e-cigarettes, 22.4% said they did so because they are available in flavors [24]. The MtF and other studies of teen vaping similarly report that e-liquid flavors are a common reason for vaping [31, 33, 34].

Family and Peer Influence

Family and peer influence also play a role in e-cigarette use [32, 33]. Young people who have family members or friends who use

e-cigarettes are more likely to be current users of e-cigarettes than those who do not [36]. Data from the 2019 NYTS indicate that slightly more than 30% of youth who ever used e-cigarettes said they did so because they had a friend or family member who used them [24].

Advertising

Over time, e-cigarette manufacturers have increased money spent on advertising from \$6.4 million in 2011 to \$115 million in 2014. During that same period, e-cigarette use among young people grew significantly. In 2014, about 7 in 10 middle and high school students (or 8.3 million) had been exposed to an e-cigarette ad [37]. By 2016, this number had risen to 8 in 10 youth (or 20.5 million) [38]. E-cigarette advertising clearly is an effective strategy for the industry. Young people regularly exposed to e-cigarette ads are significantly more likely to ever having tried e-cigarettes or being a current user. Among youth who have never used e-cigarettes, exposure to e-cigarette advertising, particularly through social media, is associated with an increased intention to use e-cigarettes in the future as well as a higher likelihood of actually doing so [39-41].

JUUL

Apart from the factors cited above, one of the biggest drivers of youth vaping in recent years has been the introduction of JUUL. JUUL is part of an emerging line of e-cigarettes

known as stealth vaporizers. These products are easily concealed and allow users to vape discretely, often in places where vaping is not allowed [8]. JUUL is a small device fashioned to look like a flash drive and is rechargeable in a USB port. JUULs use disposable pods (JUUL pods) filled with e-liquid that also serve as the mouthpiece. JUUL's e-liquid introduced a novel nicotine salt formulation which contains a much higher nicotine concentration than earlier e-liquids, delivers it faster than competitors, and does so with little throat irritation [3, 42, 43]. When originally introduced, JUUL pods all contained 5.0% nicotine, approximately the same amount of nicotine found in a pack of traditional cigarettes, and were available in a number of youth-friendly flavors such as Crème, Mango, Cucumber, and Mint. JUUL is touted as the "iPhone" of e-cigarettes and has become popular enough to spawn a new verb, "juuling" to describe use of the product [3, 44]. Young people have quickly gravitated to the JUUL for two reasons. First, youth are drawn to its small, sleek and techy design, which is inconspicuous enough that teens report vaping in class [45-47]. Second, JUUL was the first e-cigarette brand to aggressively use social media (e.g., Twitter, Instagram, Reddit, YouTube) to market and promote its products. Analysis of Twitter data show a strong correlation between the number of tweets and increasing sales of JUUL particularly over the period from 2017 to 2018 [3]. Since its introduction in 2015, JUUL has come to dominate the e-cigarette market.

Between 2016 and 2017, sales of JUUL grew by approximately 600%. Sales continued to increase and by the end of 2018, JUUL had captured 76.0% of the retail e-cigarette market [44, 48]. In the wake of JUUL's success, over 40 similar pod-type devices have entered the market all of which offer nicotine strengths that are equal to or greater than JUUL [11]. The rise in e-cigarette use noted by national and local surveys between 2017 and 2018 clearly parallels the rising sales of JUUL over the same period [23]. On a national level, the NYTS indicated that in 2019, JUUL was the most commonly used e-cigarette product among both middle and high school students [49]. Among Hoosier students, the IYTS estimated that in 2018, 6.0% of middle and 24.2% of high school students had used a JUUL in the past month [28].

Concerns about Vaping **Gateway to Combustible Cigarette Use**

A significant concern related to e-cigarettes is that their use will serve as a gateway to traditional cigarette smoking. The available research appears to support this concern. Cross-sectional studies investigating the relationship between the use of e-cigarettes and the use of combustible cigarettes have found that youth who reported use of e-cigarettes were more likely to have experimented with combustible cigarettes and were more likely to be current smokers [50, 51]. An analysis of longitudinal studies concluded that youth who reported having used only e-cigarettes at the time of their initial assessment were four times

more likely to be using combustible cigarettes a year later. Overall, these studies suggest that e-cigarette use is an independent risk factor for cigarette smoking and could potentially lead to increased smoking rates among groups of youth who were traditionally unlikely to smoke [52].

Nicotine Exposure

Adolescence is a time of significant brain development and nicotine exposure can impair the formation of areas that control mood, attention, learning, and impulse control [6, 14, 53, 54]. The adolescent brain is more sensitive to the pleasurable effects of nicotine making adolescents more susceptible to addiction [53]. There is also evidence that nicotine exposure in adolescence may prime the brain for addiction not only to nicotine, but to other substances, particularly marijuana and cocaine [54, 55]. The estimated threshold for nicotine addiction to develop in adults is an intake of 5 milligrams a day which translates to daily smoking of 4 to 5 conventional cigarettes [56]. Among youth, the threshold for nicotine dependence is much lower and can develop after use of as few as 7 cigarettes a month [57]. Considering that one 5% JUUL pod contains as much nicotine as a pack of cigarettes, youth can easily be exposed to addictive levels of nicotine with daily inhalation of the aerosol from one quarter of a pod or approximately 40 puffs [11]. The ease with which youth can become addicted to nicotine combined with the high nicotine content of JUUL and similar devices may partly

explain the increasing rates of use by young people [58]. Misperceptions about e-cigarettes can further heighten young peoples' risk for addiction. Youth may incorrectly believe that e-cigarettes do not contain nicotine, may be unaware of the nicotine content of the product they are using, or may not understand how to correctly interpret nicotine concentrations, all of which can potentially expose them to unwanted levels of nicotine [43, 59, 60]. Apart from dependence, nicotine exposure can adversely affect the cardiovascular system. A study evaluating the risk of myocardial infarction in adults using e-cigarettes showed that individuals who used e-cigarettes on a daily basis had increased odds of having myocardial infarction compared to non-users [61]. Therefore, young people who use e-cigarettes regularly may be at risk for future cardiovascular problems.

Inhalation of Toxic Substances

Although the flavor components found in e-liquid are generally recognized as safe for oral consumption by the U.S. Food and Drug Administration (FDA), components like propylene glycol and glycerol have not been deemed safe for inhalation [62]. Since e-cigarettes are relatively new products, little data exist about the effects of long-term inhalation of the ingredients found in e-liquid [6]. Exposure to propylene glycol mist can cause eye and respiratory irritation, while long-term inhalation of high doses can

negatively impact the central nervous system, behavior, and the spleen [15]. When heated and vaporized, glycerol forms acrolein and propylene glycol forms propylene oxide, which together form formaldehyde. Acrolein can cause upper respiratory tract irritation while propylene oxide and formaldehyde are both known carcinogens [15]. Diacetyl, a common flavoring ingredient in e-liquids, can cause bronchiolitis obliterans, a severe and irreversible obstructive lung disease, when inhaled in high doses [63]. Inhalation of the ultrafine particles in e-cigarette aerosol appears to promote lung disease as young people who are regular users of e-cigarettes have been found to experience higher rates of chronic bronchitis and asthma compared to non-users [64, 65]. E-cigarette aerosol may also contain heavy metals derived from the metallic heating coil, e-liquid, or any other part of an e-cigarette device. These heavy metals include chromium, nickel, and lead, all of which can be toxic when inhaled [62, 66].

Vaping-Related Lung Injury

The negative health consequences of vaping became apparent in the summer of 2019 when several hundred cases of E-cigarette or Vaping Product Use-Associated Lung Injury (EVALI) were reported to the CDC. Individuals with

Vaping as a Harm Reduction Tool

E-cigarette manufacturers often market their products as cessation tools, but the industry generates profits from the continuous sales of consumables such as e-liquid cartridges. A JUUL engineer commented “We don’t think a lot about addiction here because we’re not trying to design a cessation product at all” [11]. The FDA, which regulates all tobacco products, has not approved e-cigarettes for use as cessation devices [69]. Studies regarding e-cigarettes as tools for smoking cessation are of relatively poor quality and show mixed results [70]. Some studies suggest that e-cigarette use may help people stop using traditional cigarettes when compared to placebos [71, 72]. However, a review of a number of studies exploring the relationship between e-cigarette use and smoking cessation concluded that e-cigarette users had a 28% lower chance of quitting smoking than did persons who did not use e-cigarettes [73]. The CDC reports that e-cigarettes may potentially be beneficial as a harm reduction tool for adults who are not pregnant and use e-cigarettes as a total substitute for all other tobacco products. However, most adult users are “dual users”, meaning they continue to use regular cigarettes in conjunction with e-cigarettes [74]. One analysis concluded that should traditional smoking be replaced with vaping, there would be 1.6 to 6.6 million fewer premature deaths, with the largest gains in life expectancy experienced by younger cohorts [75]. Although replacing combustible cigarette use with e-cigarette use may provide benefits for adults who are established smokers, most youth who are currently using e-cigarettes are not using them to quit smoking [24].

EVALI experienced cough, chest pain, and shortness of breath over several days to weeks, which then progressed to more serious symptoms like fever, nausea, vomiting, and in some cases subacute respiratory failure which required intubation and mechanical ventilation. To date, a total of 2,602 cases of EVALI have occurred across all 50 states, some of which have lead to death. Most patients are men or adolescent boys (67%), are younger than 35 years of age (78%), and reported using e-cigarette products containing THC (80%) [19, 67, 68].

Key Informant Interviews

Methodology

To better understand the vaping epidemic at the state level, we completed interviews with nine key informants who are involved with state- or county-level tobacco control and prevention efforts. During the interviews, participants were asked to provide their perceptions on vaping as a public health issue among Indiana’s youth. Some aspects we focused on were whether some groups were more vulnerable to vaping than others, what products youth were using most often, why Hoosiers should be concerned about vaping, what the state was doing to address vaping, and what the state could be doing to better address vaping.

How much of a problem do you think vaping/e-cigarette use is among Indiana’s youth?

All informants expressed that vaping was a significant problem in Indiana, stating that it is

“...huge right now”. One informant said, “I totally agree with the Surgeon General, Dr. Jerome Adams, that it’s an epidemic.”

Two informants substantiated their claims by referencing data from the 2018 Indiana Youth Tobacco Survey (IYTS) that showed a 400% increase from 2016 in e-cigarette use among middle and high school students, an increase which translates to 35,000 more youth using e-cigarettes.

It was the opinion of all key informants that the increase in e-cigarette use was primarily driven by JUUL and JUUL knock-off products.

“I think it’s JUUL having 75% of the market now...that is the primary driver...”

Informants indicated that youth find JUUL and similar products appealing because of their unique design.

Another aspect that appeals to youth is the availability of different JUUL pod flavors, “I definitely think it is the flavors”, “Number one, flavors are definitely appealing”. Informants also expressed that JUUL products in particular are attractive as they do not smell, can be used discreetly, and do not carry the stigma of combustible cigarettes.

Regarding youth access to JUULs or similar

products, respondents generally agreed with the findings of the 2018 IYTS that “the majority of youth report getting products from a social source, from classmates [and] friends”. However, it was the impression of other respondents that youth are also accessing e-cigarette products to a lesser extent through sources such as the internet, convenience stores, gas stations, and vape shops.

“I think JUUL has been so popular that every company is coming up with a JUUL-like kind of product. I think at some point, they [youth] aren’t going to care quite as much if it is actually a JUUL but that it is sleek and discrete, kind of sticks with the electronic kind of cool, you know, they have a Smart Watch looking thing.”

What groups of young people are particularly vulnerable to vaping or appear to be vaping at higher rates?

When asked to discuss whether there are certain groups of young people who are more vulnerable to vaping or who may be vaping at higher rates than others, most informants indicated that “younger kids, 6th, 7th, and 8th grade” would be the most vulnerable population. In general, informants felt that White youth were vaping at higher rates than both Black or Hispanic youth, and older youth were vaping at higher rates than younger youth. Informants agreed that “They are all using it

[e-cigarettes] with one primary driver of use being the predatory marketing tactics of JUUL and other e-cigarette makers.” One informant put it succinctly as:

“I say in every presentation that I give JUUL did not care who it targeted. It did not target to the African-American or the LGBT [community] alone. It targeted to us. I feel it targeted to the poor, to the rich, to the low education, to the high education. It did not discriminate.”

Why is vaping problematic and why should we be concerned about it?

According to our informants, concerns and health risks associated with vaping are manifold. Several informants cited the impact of nicotine on brain development “we are concerned about nicotine on the developing brain...the area of the brain that affects learning, mood, impulse control, concentration...”, and “it [nicotine] impairs fetal development”.

A number of informants mentioned that the high level of nicotine found in JUUL-type devices “... results in symptoms of dependence”, and that “it can ultimately start that line of addiction by engaging the parts of the brain that are a primer for addiction”.

Another informant expressed that dependence on e-cigarettes could serve as a gateway to other tobacco products, “Will they be

transitioning to another tobacco product? Does it serve as a gateway to other drugs?” while another participant cited the statement by the U.S. Surgeon General concluding, “...that e-cigarette use is strongly associated with the use of other tobacco products.”

Informants further indicated that Hoosiers should be concerned about vaping as “... these products are largely still unregulated”, consequently “we are not very clear on what youth are putting into their bodies, ingesting, blowing out into the air that people are getting in contact with”. “Health risks are definitely turning up now”, such as with the lung illnesses being documented throughout the nation, but that it will “...take many years, perhaps decades, before we understand the health consequences of using them.” Informants believed that youth are being used by the tobacco industry as test subjects for the effects of e-cigarette use.

One informant summed up the situation concisely with the statement that we should be concerned “...because people are dying.”

“...This generation is the new guinea pig for the tobacco industry and by the time they really get the data and the science behind it to know how harmful it is, the current generation is already going to be hooked and addicted.”

What is Indiana currently doing to address vaping?

When asked to discuss what Indiana was currently doing to address vaping, all informants referred to the plan put forward by Indiana Governor Eric Holcomb. The Governor’s plan, known as [Vape Free Indiana](#), is being coordinated by the Indiana State Department of Health’s Tobacco Prevention and Cessation Commission, and consists of a three-pronged approach: prevention, public education, and cessation. The first part of the initiative is focused on prevention, and includes programs such as CATCH My Breath®, a school-based curriculum program designed to educate young people about vaping, and Sweet Deception, a peer-to-peer education program in which youth leaders present information to their peers on the myths around e-cigarette use. The second part of the initiative focuses on public education, and features media campaigns such as Behind The Haze, a youth-focused campaign on social media platforms that launched in November, 2019, as well as an adult-focused campaign set to launch in 2020. The third part of the initiative provides free resources for quitting e-cigarettes, including a text-based quit service designed for youth who want to quit vaping called “This is Quitting,” in partnership with the Truth Initiative, as well as the Indiana Tobacco Quitline’s suite of services for all tobacco users aged 13 and up. There are additional resources on the Vape Free Indiana website for parents, youth, educators, and health care professionals. Opinions of the Governor’s plan varied.

In a perfect world, if we had all the necessary resources available to us, what would the ideal prevention/intervention model look like?

Finally, informants were asked to discuss what an ideal prevention and/or intervention model would look like if the state had all the necessary resources available. Informants expressed a variety of views; however, most focused on prevention:

“I think it starts with a well-funded and well-run state prevention program following CDC best practices. I think it would also include reaching kids where they are. A program needs to have community resources, they need to be staffed. Each community would need to have resources to help people quit. It’s going to mean investing in [web-based and social-media-based] communications. I think policy makers are uncomfortable investing state dollars that way. We’re going to have to get over that hesitation if we really want to reach kids...”

Other informants similarly believed that “I can’t help but think that if we had the ability to implement CDC’s best practices for tobacco control programs to the fullest extent over the past decade maybe we wouldn’t be in this predicament.” Additionally, two other informants reported that the state needed to invest more money into the state’s Tobacco Prevention and Cessation Commission (TPCC)

and ease the restrictions on how TPCC can use their budget, if more statewide change is to be seen. The majority of other respondents indicated that the ideal model would allow the state “...to get to the kids at a young age...” and “...make them [youth] aware of the risk and protective factors for use at an early age and get parents to understand some of those signs...”; furthermore, it “...shouldn’t be focused on penalizing use [as] being punitive with youth is not an evidence-based way to deal with use.”

Policy Implications and Recommendations

Both national and state-level public health officials and substance use prevention officials agree that youth vaping can only be decreased by implementing strong policies, such as the following:

Ban Flavors

The 2009 Family Smoking Prevention and Tobacco Control Act prohibits the inclusion of characterizing flavors (e.g., candy or fruit) other than tobacco and menthol in cigarettes. Other tobacco products are not currently prohibited from containing such flavors [76]. Considering that most youth who use tobacco products and especially those who use e-cigarettes use flavored products [24], one approach to reduce the use of e-cigarettes would be to ban characterizing flavors particularly menthol, candy, fruit, and alcohol flavors [7]. While placing a ban on youth-friendly flavors may dissuade youth from trying e-cigarettes, it

may also increase the likelihood that youth experiment with other flavored tobacco products such as snus². Currently, the FDA is evaluating the impact of flavors on tobacco use and addiction and a ban on all characterizing flavors including menthol may be forthcoming [77].

Cap the level of nicotine available in e-cigarettes

Currently, the U.S. does not place restrictions on the nicotine content of e-cigarette products, and high nicotine content products account for the greatest percentage of e-cigarette sales [78]. One approach to limiting the attractiveness of e-cigarette products to youth as well as reduce the risk of dependence could be to restrict the nicotine content to a level similar to the 20 mg/L found within the European Union. Higher nicotine e-liquid products could potentially be made available through a doctor's prescription should the FDA determine that e-cigarettes are effective tools for smoking cessation among adults [11].

Tax e-cigarettes and price them at levels comparable to cigarettes

As youth generally have less discretionary income, the modest pricing of JUULs and other e-cigarettes provides adolescents relatively easy access to these products compared to traditional cigarettes. Increasing taxes on cigarettes has consistently been shown to

be effective in preventing and reducing use of traditional cigarettes among youth [79]. Currently, Indiana does not impose a tax on e-cigarette products. Taxing e-liquid, e-cigarette devices, and replacement pods in a fashion similar to traditional cigarettes may increase the price sufficiently to deter many youth from initiating use [7, 15].

Adopt more comprehensive smoke free laws

All areas that prohibit the use of conventional cigarettes and combustible tobacco products should also prohibit vaping. Although Indiana enacted a smoke-free air law in 2012 prohibiting smoking of combustible tobacco products in most public places and many workplaces, the law does not address the use of electronic cigarettes. At present, nearly all school corporations throughout the state are considered tobacco free; however, 44 do not include e-cigarettes in their tobacco policies and 3 corporations are still not tobacco free.

Public education/media campaigns

Well-designed media campaigns that have targeted the use of traditional cigarettes have been effective in reducing cigarette use and increasing quit attempts among adults, while also preventing youth from initiating cigarette use [80-82].

²Snus is a newer form of moist snuff used in the United States.



Increase restrictions on tobacco licenses and improve enforcement efforts for retailers

Key informants from Indiana additionally mentioned that vaping might be reduced if tobacco products were less available to youth. Informants proposed developing stricter requirements for businesses that wanted to obtain a license to sell tobacco products. Additionally, respondents believed that retailers may be more likely to observe laws which prohibit the sale of tobacco to persons under 21 if enforcement efforts were improved and penalties were more significant.

What else should the state be doing to address vaping?

Apart from these types of legislative policies, several informants expressed "...a need to come up with some strategies specifically on how schools should be handling vaping". Informants indicated that schools across the state employ a wide range of methods to address vaping, some of which are punitive in nature. Rather than using out-of-school suspensions or expulsion, "...because I mean what are they going to do, they are going to sit at home and vape their e-cigarette" informants proposed that the state establish a uniform policy for schools on how to handle vaping, involving various strategies such as fines or citations, in-school suspensions with a counseling component, and education.

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