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## **Middlesex-London Health Unit (Ontario) Submission to the Proposed Vaping Product Reporting Regulations**

The Middlesex-London Health Unit (MLHU) welcomes the opportunity to submit feedback on proposed legislative and regulatory amendments to require vapour product manufacturers to report ingredients and sales data to Health Canada. Since March 2019, the MLHU has made several submissions providing comments and feedback on the *Tobacco and Vaping Products Act (TVPA)* and Regulations. The proposed regulations to require vaping product manufacturers to disclose information to Health Canada about sales and ingredients used in vaping products is an important measure to allow Health Canada to keep informed about the rapidly evolving vapour product market. The Middlesex-London Health Unit supports this measure and applauds the federal government for proceeding with this regulatory measure. This submission offers additional comments pertaining to more stringent regulatory and legislative amendments that are required to address the real issues underlying the current impact of vaping in Canada, within the context of the existing legal framework provided by the federal *Tobacco and Vaping Products Act*

### **PROPOSED REGULATIONS – DISCLOSURE REQUIREMENT FOR MANUFACTURERS**

Local public health units, non-governmental organizations, health care practitioners and all levels of government across Canada need to be responsive to the social and health impacts that the use of vapour products have on individual and population health. Ensuring that Canadians remain informed of vapour product industry practices is important to supporting the efforts of health, non-governmental, and governmental agencies to be able to respond to an evolving vapour product market. British American Tobacco plc, Altria Group Inc., Japan Tobacco Inc., Imperial Tobacco Group, Philip Morris International Inc., VMR Products LLC, NJOY Inc., International Vapor Group, Nicotek LLC, VMR Products LLC, MCIG Inc., ITC Limited, and J WELL France are the predominant companies that are operating in the e-cigarette market (2022). In 2018, the global e-cigarette market was valued at about US\$14.05 Billion, and in just five years, has reached a market value of US\$20.4 Billion (2021) and is projected to reach US\$30 Billion by 2027 (Business Wire, 2022). The tobacco industry has a long history of deceptive marketing and advertising practices and authoring reports with inaccuracies as to the addictive nature and health consequences of commercial tobacco use. (Ontario Agency for Health Protection and Promotion, 2017). The proposed regulations would require manufacturers of vaping products to provide Health Canada with the following information:

- Report on vaping product sales – information on sales of vaping products by brand sold in Canada and for export.
- Report on ingredients – information on the ingredients of vaping substances by brand sold in Canada.

In addition to the required product reporting, it is important for Canadians to have an accurate picture of tobacco and vapour product industry non-compliance with all mandated federal regulations through annual reports and a public disclosure system. More importantly, vapour product manufacturers should also be required to submit toxicological or other health impact data. **The Middlesex-London Health Unit recommends that vapour product manufacturers be held to the same standard of accountability and scrutiny as tobacco product manufacturers through the enactment of the proposed regulations. Further, the Middlesex-London Health Unit strongly recommends the implementation of a public non-compliance disclosure system and mandated submissions of toxicological and health impact data by vapour product manufacturers regarding their products.**

## **FURTHER ACTION REQUIRED TO ADDRESS HEALTH CONSEQUENCES FROM VAPING**

### **The Need for Revised Health Canada Messaging and Urgent Review of Evidence**

Vaping prevalence rates have skyrocketed in recent years, particularly among youth and young adults. The nation-wide prevalence of vaping among students (grades 7-12) has doubled, rising from 10% in 2016-2017 to 20.2% in 2018-2019. (Health Canada, 2018; 2019). Since the 2018 publication of the assessment of vaping (“Public Health Consequences of E-Cigarettes”) by the US National Academy of Science, Engineering and Medicine (NASEM), scientific understanding of the various harms now known to be associated with e-cigarette use by young people has significantly increased. As noted by colleagues at [Physicians for a Smoke-Free Canada](#) (PSC), the NASEM assessment was based on only one-third of the evidence available today (PSC, 2022). PSC’s blogpost on the current status of Health Canada’s messaging on vaping and its impact on younger users reads, in part, as follows:

In its 2018 assessment, the NASEM panel of experts explored the scientific evidence behind 47 conclusions finding that there was conclusive or substantial scientific evidence for only 18, moderate evidence for 8, and limited or no evidence for 21 of the conclusions. Fifteen of the 18 conclusions for which there was strong or substantial level of confidence confirmed potential harms from these products and only two conclusions related to potential benefits of vaping. (PSC, 2022)

The NASEM panel of experts concluded that e-cigarette users who entirely quit using tobacco products and transition to vapour products were exposed to fewer of the chemicals found in cigarette smoke and they experienced short-term health consequences in some organ systems (PSC, 2022).

The amount of available scientific evidence regarding the safety and dangers of vapour products is growing and since 2018 other governments have tasked scientists to conduct reviews. There is a building scientific consensus that warns that vaping is dangerous and not particularly useful as a cessation method, especially when purchased and regulated as a consumer product as it is in Canada (PSC, 2022). At present, there is no updated authoritative document that has brought together available systematic reviews, meta-analyses and reports from researchers and pertinent health/government agencies; however, according to Physicians for a Smoke-Free Canada (2022), some conclusions can be drawn that warrant significant consideration when considering public health messaging and government legislation:

1. E-cigarettes have increased the number of young nicotine users in some countries;
2. Young people who use e-cigarettes are more likely to smoke conventional cigarettes;
3. Dual use is common and harmful;
4. When purchased as consumer products, e-cigarettes are not effective cessation aids;
5. E-cigarettes cause damage to respiratory and circulatory systems;
6. Other governments have provided more recent scientific assessments.

Concerns about health consequences from vapour product use and the creation of a whole new generation of people addicted to vaping nicotine have now reached a point that on June 23, 2022, the US Food and Drug Administration (FDA) issued market denial orders (MDOs), with immediate effect, to all JUUL products in the United States of America (US). These MDOs require that the company must immediately stop selling and distributing its products in the US, and that in addition, JUUL products currently on the US market must be removed or face enforcement action. The FDA stated that JUUL’s application to market their products “lacked sufficient evidence regarding the toxicological profile of the products to demonstrate that marketing of the products would be appropriate for the protection of the public health”, and further, that JUUL products “have played a disproportionate role in the rise in

youth vaping” (FDA, 2022). While a US federal appeals court has issued a temporary stay blocking the nationwide ban until the matter proceeds through the court system, the action employed by the FDA warrants careful consideration and analysis by Health Canada. A more rigorous approach, requiring vapour product manufacturers to prove the safety and efficacy of their products prior to sale, may be warranted. **In light of this recent development, the Middlesex-London Health Unit recommends that Health Canada determine the health consequences that may be caused by vapour products, and that Health Canada’s messaging and regulatory approach be reviewed and revised to reflect the results of this review. Health Canada is encouraged to publish the results of this evidence review within six (6) months as timely action would be beneficial.**

### **Vapour Product Flavouring and Additives**

The plethora of flavours in vapour products has posed significant challenges in public health efforts to halt vapour product uptake, especially by young people. Youth consider the flavour of vaping products to be the most important factor when trying e-cigarettes, and vaping initiation is more likely to occur with fruit, sweet, menthol and cherry flavoured products (Zare et al. 2018). Additionally, when non-traditional flavours are restricted and mint and menthol remain on the market, young people shift their purchasing and consumption preferences toward mint and menthol flavour (Morean et al., 2018; Diaz et al., 2020). Therefore, MLHU encourages Health Canada to reconsider regulations on the exclusion of menthol and mint flavours from the pending ban on flavours under the *Tobacco and Vaping Products Act*. According to Al-Hamdani, Hopkins, and Davidson (2021) and the 2020-2021 Youth and Young Adult Vaping Project, almost all vapour product users consumed a flavoured vape juice both at initiation (91.9%) and at present (90.3%). In addition, in most provinces, berry, mango and mint/menthol were the most reported flavours being used (Al-Hamdani, et al., 2021). Section 30.41 of the *Tobacco and Vaping Products Act* states:

No person shall promote or sell a vaping product that has an appearance, shape or other sensory attribute or function for which there are reasonable grounds to believe that it could make the product appealing to young persons.

It is anticipated that the amendments to Schedules 2 and 3 to the *Tobacco and Vaping Products Act* (Flavours) and Standards for Vaping Products’ Sensory Attributes Regulations could come into effect by late 2022. **The Middlesex-London Health Unit highly recommends that Health Canada implements the regulation to ban all vapour product and e-substance flavours, including mint and menthol or a combination of mint/menthol, except for tobacco flavoured products, without delay.**

### **Vapour Product Promotion and Advertising**

The current restrictions on advertising and promotional activities are inadequate. At present, all advertising for vapour products is permitted, unless specifically prohibited; whereas, the reverse is true for tobacco products. Vaping products should be brought under the same advertising and promotion control framework as tobacco. Advertising at such places as recreational facilities, restaurants, places of entertainment, post-secondary institutions, broadcast media, in print publications and online/social media should be strictly prohibited given the potential for youth exposure. A 2019 national Leger poll found that 86% of Canadians believe that the government should apply the same advertising restrictions to vaping products with nicotine as it does to tobacco products in order to protect youth (Leger, 2019). Additionally, there should be a complete ban on offering free or discounted vaping products. There is a substantial body of evidence that supports price control measures and strong taxation regimes for reducing youth and young adult smoking initiation as they are more sensitive to price increases (Public Health Ontario, 2017). According to Huang, Tauras and Chaloupka (2013) and research conducted by Corrigan and colleagues (2021), policies increasing the price of vapour products through a taxation regime and by limiting rebates, discount pricing, and coupons/bulk buying incentives would be highly effective at preventing youth and young adults from initiating the use of vapour products. **The Middlesex-London Health Unit highly recommends that Health Canada implement a comprehensive framework that strictly regulates advertising and promotional activities in**

**alignment with current controls in place for tobacco products. Further, the inclusion of product pricing measures and prohibitions on incentive and bulk buying programs are required.**

### Nicotine Concentration and Uniform Dosing Levels

Data from the 2018-19 Canadian Student Tobacco Alcohol and Drugs (CSTADS) survey showed that 20.2% of Canadian students (approximately 418,000) had used an e-cigarette (with or without nicotine) in the past 30 days (Health Canada, 2019). Students that reported vaping (with or without nicotine) in the past 30 days were vaping regularly with approximately 40% reporting daily or almost daily use (Health Canada, 2019). CSTADS also showed that vaping had led to an overall increase in nicotine use by youth, which suggested that vaping had not replaced smoking behaviours among young people. In fact, the total prevalence of vaping and smoking among young people was much higher than the prevalence of smoking in that population a decade ago. By far, most of the youth in Canada who vaped were using devices that contained nicotine, with 87.6% of all current grade 7-12 students vaping nicotine (Health Canada, 2019). In addition, according to the 2020-2021 Youth and Young Adult Vaping Project, of the 3000 individuals between the ages of 16 and 24 who were interviewed, 64.3% reported using vape juice containing the highest possible concentrations of nicotine (50-60 mg/ml) (Al-Hamdani et al., 2021).

Nicotine is a highly addictive substance that poses significant risk, especially to young people. The brain continues to develop until an individual reaches the approximate age of 25. Exposure to nicotine during brain development can result in nicotine addiction, mood disorders, permanent lowering of impulse control, and changes to attention and learning (NASEM, 2018). Other health impacts include increased blood pressure, increasing risk of heart disease and stroke (Gonzalez and Cooke, 2021), and the potential for increased risk of the spread of breast cancer to the lungs (Huynh et al., 2020). The adverse effects from the use of high concentrations of nicotine include vomiting, headaches, dizziness, nausea and in extreme cases, fainting and nicotine poisoning (NASEM, 2018).

As the Middlesex-London Health Unit noted within its [submission in January 2020](#) to Health Canada's consultation on the [Vaping Products Promotion Regulations](#), federal regulation of nicotine levels offers consistent protection from nicotine addiction for youth across Canada, by bringing the current patchwork of provincial regulations into alignment across Canada. Nicotine is a highly addictive substance and reported youth preferences for products with the highest levels of nicotine (Al-Hamdani et al., 2021) justifies the requirement for Health Canada to monitor the scientific evidence on an ongoing basis and adjust product limits accordingly.

Another important factor related to nicotine concentration levels is the application of vapour product design standards to ensure the consistent and uniform dosing of nicotine to vapour product users. According to the European Union's (EU) Commission investigating the latest available evidence on vapour products, at present, vapour products are not held to design and manufacturing standards that ensure that the device delivers the same amount of nicotine per puff by the user (European Union SHEER, 2021). Given that cigarettes are engineered to deliver consistent doses of nicotine, it appears logical that e-cigarettes should do the same if they are to effectively replace nicotine delivered from cigarettes.

**The Middlesex-London Health Unit commends the Federal Government's enactment of the 20 mg/ml nicotine concentration level maximum for vapour products but encourages Health Canada to publish peer-reviewed evidence of the safety of all types of vaping products within six (6) months. Further, if the products are deemed to be safe for continued sale, the Middlesex-London Health Unit recommends Health Canada to develop a process that would allow for downward adjustments to maximum nicotine concentration levels. Further, if the products are deemed to be safe for continued sale, it is recommended that Health Canada impose product engineering standards to ensure uniform nicotine dosing so that users know how much nicotine they are inhaling.**

### Rethinking Retailer Regimes for the Sale of Tobacco and Vaping Products

Between 2020 and 2022, MLHU observed an increase in the number of tobacco youth access test shopping failures, as well as an all-time high rate of vapour product youth access test shopping failures. Prior to 2020, MLHU's tobacco and vapour product youth access compliance rates were ~99.9%. Tobacco Enforcement Officers (TEOs) within Middlesex-London are noting an alarming trend. Between October 2021 and June 2022, TEOs and youth test shoppers have completed 265 youth access checks for vapour products that have resulted in 28 failures (89.4% compliance rate). Most of the youth access failures were at non-specialty vape stores, including convenience stores and gas stations, using youth test shoppers who are between 15 and 16 years of age -- well below the legal age of 19 years in Ontario. Other public health units in Ontario are reporting similar rates of non-compliance with the youth access provisions of the *Smoke-Free Ontario Act, 2017*.

Under the *Smoke-Free Ontario Act, 2017 (SFOA, 2017)*, vapour products flavoured with mint, menthol and tobacco can be sold in non-specialty vape stores (e.g. convenience stores, gas station kiosks, grocery stores, etc.); whereas, vapour products that contain other flavours may only be sold in age-restricted specialty vape stores. Furthermore, under the *SFOA, 2017*, vapour products that have a nicotine concentration of greater than 20 mg/ml can only be sold in age-restricted specialty vape stores. In the Middlesex-London area, during this latest round of youth access inspections, many of the vapour products that were sold to youth test shoppers from non-specialty vape stores were flavoured with fruit and candy-flavoured additives and had a nicotine concentration of greater than 20 mg/ml, despite the provincial legislation. Vapour products with nicotine concentrations greater than 20 mg/ml continue to be sold at retail, both in brick and mortar stores and online despite federal legislation. The illegal sale of these products has resulted in the issuance of charges for the sale of prescribed vapour products in a prohibited place and the seizure of these products. Between June 2021 and June 2022, public health units, including the Middlesex-London Health Unit were stretched to capacity, engaged in the local public health unit response to the COVID-19 pandemic; therefore, most, if not all *Smoke-Free Ontario Act, 2017* public health unit enforcement programs were operating at only base levels. Many Health Units were unable to continue to educate and inspect all tobacco and vapour product retailers, and most were forced to pause youth access test shopping inspections. Despite the reduced enforcement officer presence within the Middlesex-London community, between June 2021 and June 2022, tobacco enforcement officers (TEOs) for MLHU have conducted a total of eight vapour product seizures, with estimated values ranging from \$200 to \$25,000 from each establishment, totaling approximately \$37,000 (1251 products). **Provincially, 12 public health units reported that between June 2021 and June 2022, a total of 13,061 prohibited vapour products (flavoured and for sale in a non-specialty vape store, and/or nicotine concentrations >20 mg/ml) were subject to seizure (retail value of \$234,050). Additionally, two public health units reported that they had two inspections that resulted in finding 2200 prohibited products valuing \$380,000 but were unable to complete the seizure because the volume of product exceeded local seizure capacity. At least 15 referrals to Health Canada were made by Ontario public health units for infractions related to the Tobacco and Vaping Products Act.** Despite the loss of merchandise through seizures and the fines that are being issued under the *SFOA, 2017* by Ontario Public Health Unit inspectors, it has become apparent that the fines and seizures of vapour products are an insufficient deterrent to influence retailer compliance. Anecdotally, Enforcement Officers have been told that for products that are approximately \$20 per unit, the retailer profits between \$5.00 to \$9.00 per item. The available supply of these products seems endless and the potential for profit exceeds the risks of being caught.

Under the *SFOA, 2017*, routine non-compliance with tobacco sales offences results in the issuance of an automatic prohibition order under Section 22. At present, there is no automatic prohibition lever that can be applied to retailers who continue to sell vapour products to persons under the age of 19 years, nor for non-specialty vape stores that continue to sell vapour products that should only be available for sale in age-restricted stores in Ontario. Operators have shared with MLHU TEOs that the total revenue from sales of vapour products alone far exceeds both the fine amounts and the risk of product seizures and is viewed as a cost of doing business. Based on the current compliance rate and reported retailer behaviors, current vapour product retail regulations are insufficient.

It may be warranted for Health Canada to consider retail reforms. **The Middlesex-London Health Unit recommends that Health Canada implement an automatic prohibition regime for both tobacco and vaping products under the TVPA modelled after Section 22 of the *Smoke-Free Ontario Act, 2017*, for repeated convictions against retailers including those who:**

- **sell tobacco and/or vaping products to persons under the legal age;**
- **sell flavoured tobacco and vaping products prohibited by law; and,**
- **sell vaping products with nicotine concentration levels that exceed 20 mg/ml.**

In addition, due to the pervasive retail availability of tobacco and vapour products and the continued availability of prohibited vapour products in brick and mortar stores across Ontario, **the Middlesex-London Health Unit recommends that Health Canada should consider limiting the sale of tobacco and vapour products to age-restricted stores only.**

### **Reciprocal Relationships and Cooperation Between Federal and Provincial Inspectors**

In Ontario, the display, promotion and sale of tobacco and vaping products at retail are regulated by both provincial and federal legislation. The TVPA is enforced by Health Canada Inspectors exclusively, who are responsible for monitoring and ensuring compliance with the Act and the Regulations. In Ontario, public health unit staff are designated by the authority outlined under the *Smoke-Free Ontario Act, 2017*, to enforce the requirements and restrictions at retail under provincial legislation exclusively, with no authority under the TVPA.

Given the size and scope of jurisdiction that falls to the Health Canada Inspectorate, it is difficult for their Inspectors to respond to the referral in a timely matter. This means that in many cases, vapour products, prescribed by federal law to be “illegal” and subject to federal seizure, remains within the store for continued sale. There is significant consumer demand for this product; therefore, despite warnings issued by provincial inspectors, product will remain on store shelves available for sale or for distribution through other illegal means. In Ontario, there has been some success with reciprocal relationships and collaboration between Ontario Ministry of Finance Inspectors (enforcement of the *Tobacco Tax Act*) and public health staff (enforcement of the *SFOA, 2017*). For example, if illegal tobacco products (under the *Tobacco Tax Act*) are found within a retailer, and a Ministry of Finance Inspector is not within the jurisdiction, under direction of the Ministry of Finance Inspector, the Health Unit Inspector will safely secure the product off site until the Ministry of Finance Inspector can attend to seize the product for their investigation. Not only does this reciprocal and collaborative relationship help to remove illegal products from the marketplace, but it also increases public and retailer perception of a greater enforcement presence, which contributes to greater compliance overall. It is recommended that a similar arrangement be explored between federal and provincial enforcement agencies given the continued availability of flavoured and high nicotine concentration products. Alternatively, the cross designation of provincial and federal inspectorate for sections of the TVPA and Regulations that pertain to retail could also be explored.

**The Middlesex-London Health Unit recommends that Health Canada engage with provincial Ministries of Health and representatives from local public health enforcement to explore how best to collaboratively implement retail reforms, and to discuss options that exist to support collaborative and more timely enforcement action.**

### **Tighten Restrictions for Online Retail Marketing**

Besides the availability of vapour products at retail outlets such as convenience stores, gas stations, grocery stores, and specialty vape stores, vapour products are widely available for sale through websites and social media (Hammond, et al., 2015). While many online vendors use age-verification measures during online purchase, people under the age of 18 years are still able to purchase vapour products online (Hammond et al., 2015). In 2017, the Canadian Tobacco and Drug Survey (CTADS) indicated that more than 75% of youth age 15 to 19 years who tried a

vaping product borrowed, shared or bought it from a friend or relative (Health Canada, 2018). In 2019, the Canadian Tobacco and Nicotine Survey showed that social access of vaping products among those aged 15 to 19 years had dropped to 58%, and 43% of this age group purchase from retail sources, including online vendors (Health Canada, 2019).

Underage youth who purchase vaping products online either falsely claim to be of legal age when they access the website, or they are not required to show proof of age. A content analysis of internet e-cigarette vendor practices discovered that most vape vendors (over 60%) did not require age verification or relied on ineffective strategies such as checking a box to verify legal age (Williams et al., 2018). Similarly, Gaiha and colleagues (2020) found that more than a quarter of underage e-cigarette users surveyed were not required to verify their age when purchasing e-cigarettes online.

The local experience within Middlesex-London is in congruence with the evidence. Since resuming in-person learning within Middlesex-London schools in the fall of 2021, approximately 80% of youth are telling TEOs they buy vapour products online. Young people are reporting that they find it easy to get vaping products through online sources. One youth stated that the vapour products are delivered to their mailbox and that he can easily conceal the purchase from his parents because it is his responsibility to pick up the mail after school.

Some specialty vape stores that formerly operated brick and mortar stores in Ontario have shifted to manufacturing and wholesale, and/or to online-based operations to continue to sell flavoured and high nicotine concentration products to all ages, with less enforcement scrutiny. These products are shipped directly to customers' houses or offered through curbside pickup. This process applies the obligation of age verification to the agents/agencies used for delivery. Enforcement agencies, at both the federal and provincial levels, are challenged to be able to effectively monitor retailer compliance with youth access provisions.

Industry brand-incentive programs, like the "Vuse – Click and Collect" program, are also operating in communities across Ontario. This program allows customers to place their orders online and then pick up the vapour products, including all flavours and nicotine concentrations, at select convenience stores. Programs like this appear to have been able to find legislative loopholes and they contribute to the erosion of progress that had been made to prohibit youth access to tobacco and vapour products and to restrict access to flavoured and high nicotine concentration vapour products.

The *TVPA* prohibits youth access to vaping products in a public place or in a place to which the public has access, which includes online retailing. The *Act* specifies that a person, including a retailer, must verify the age of a person purchasing vaping products, however it does not specify how age verification is to be implemented. The current system on many websites of clicking a box to attest to being of age has obvious pitfalls.

**The Middlesex-London Health Unit recommends that Health Canada works with provincial Ministries of Health to implement consistent and strict requirements to regulate online sales, including the following measures:**

- **Require online retailers to post information advising prospective customers that the sale of vaping and tobacco products are restricted to persons of legal age;**
- **Require two-step age verification for online retailing - the two-step process should involve two authentication methods performed one after the other to verify identity;**
- **Require online retailers to utilize third-party verification services;**
- **Require tobacco and vapour products to contain a label that states that age verification is required at delivery;**

- Upon delivery, require that a signature be obtained from the person who ordered the package, confirming they are of legal age, and packages must not be left on doorsteps;
- Require that delivery be restricted to prescribed carriers.

### **Enactment of a Vapour Product Pre-Tax Set Price Minimum**

There is unequivocal evidence documented in the tobacco control literature that price increases result in decreased demand and use of cigarettes, and increased intentions to quit smoking (SFO-SAC, 2017). Many provinces have proposed or passed legislation to tax vapour products, including British Columbia, Alberta, Prince Edward Island, Saskatchewan and Newfoundland and Labrador. The Federal Government's announcement of the national tax regime on vapour products as a measure to reduce the consumption of vapour products by youth and young adults is commendable, as they tend to be more price sensitive than adults (U.S. Department of Health and Human Services, 2000). The revenue from taxes from tobacco products along with the revenue from the taxation regime applied to vapour products could be used to fund comprehensive tobacco and vapour product control programming, including prevention and cessation efforts, increased compliance monitoring and enforcement, and ongoing research. A complementary measure to increase the retail price of tobacco and vapour products is to mandate a minimum pre-tax set price minimum (Feighery, et al., 2005). Setting minimum price limits inhibits the manufacturers' ability to use discount pricing and the retail sale of low-cost brands or devices to offset the price increases from taxation (SFO-SAC, 2010). Minimum price policies are effective and widely used to reduce alcohol consumption and harms (Anderson, et al., 2009). The taxation level and the set price minimums for vapour products should be set independently from tobacco products, with careful consideration being given to ensure that e-cigarettes do not become more expensive than cigarettes but set high enough to deter youth, young adults and non-smoker initiation. **The Middlesex-London Health Unit recommends that Health Canada enact a minimum pre-tax set price minimum for vapour products to reduce youth and young adult consumption and associated harms from vapour product use. Further, it is recommended that Health Canada discuss the establishment of complementary vapour product taxation regimes with provincial governments**

### **Appealing Vapour Product Marketing and Unsubstantiated Health Claims**

Websites selling vapour products online are ubiquitous and use marketing tactics that are appealing to youth. In 2019, the Ontario Tobacco Research Unit (OTRU) collected samples of flavoured vaping products from online Canadian vape stores and found several examples of flavoured vaping products with attractive packaging, design elements, names and descriptors with youth-appeal (O'Connor, et al., 2019). Furthermore, researchers who conducted a systematic content and legal analysis of the claims made by e-cigarette manufacturers and retailers on their websites concluded that the vast majority of websites made at least one health-related claim, focusing on potential health benefits while minimizing or eliminating information about possible harmful effects of vaping products (Klein, et al., 2016). Grana and Ling's (2014) content analysis of e-cigarette retail websites also discovered that health claims and cessation messages that are unsupported by current scientific evidence are frequently used by vapour product retailers to sell vaping products (Grana and Ling, 2014). Vaping products have not been approved by Health Canada as a smoking cessation aid because they are not currently tested, manufactured, and regulated as such in Canada. Therefore, claims about vapour product efficacy as a cessation tool should be strictly prohibited.

Enforcement reports from Health Canada inspectors reinforce the lack of compliance by online retailers with current promotion and advertising restrictions under the *TVPA*. Between July 2020 and March 2021, Health Canada inspectors conducted inspections of Instagram social media accounts to assess vapour product industry compliance, with a focus on publicly accessible online promotions. Inspectors reviewed 304 accounts on Instagram and observed non-compliance on 53% of the accounts, resulting in the issuance of a warning letter (Health Canada, 2021). Increased enforcement (issuance of fines) and stricter prohibitions on vapour product advertising are required.



**The Middlesex-London Health Unit recommends that Health Canada prohibits online vapour product retailers from making health claims, using celebrity and medical professional endorsements, and promoting e-cigarettes as a cessation aid. Increased compliance monitoring and the use of progressive enforcement measures (Part I charges and Part III summonses) are recommended.**

### **Vapour Product Appearance, Packaging Design and Health Warnings**

In November 2019, Canada implemented plain and standardized tobacco product packaging regulations, and at present, have a public consultation process open seeking feedback on proposed amendments to the Tobacco Product and Packaging Regulations. If enacted, the regulations would strengthen and update current health-related messages, extend labelling requirements to all tobacco product packages, implement periodic rotation of messages (every 24 to 36 months) and introduce text health warnings on individual cigarettes, little cigars that have a filter, and tubes, among other measures. Further, the proposal would consolidate all tobacco product labelling and packaging requirements in a single set of regulations -- the *Tobacco Products Packaging and Labelling Regulations*. According to Moodie, Mackintosh, Hastings and Ford, (2011), studies have determined that the colour, shape and size of a package can influence consumer behaviour and contributes to consumer perceptions of the product. Package design can make its contents appear safe to use, undermining the visibility, credibility and effectiveness of health warnings. The same body of evidence can be applied to the regulation of vapour products and packaging. As proposed, the requirement for health warning messages on individual cigarettes will help to reach youth who are being supplied individual cigarettes by social sources; however, with youth vaping rates escalating, attention to vapour product design, packaging and health warnings require similar priority. **The Middlesex-London Health Unit recommends that Health Canada apply a similar plain and standardized packaging regime to vapour products that Health Canada has already applied to commercial tobacco and cannabis products. Additionally, updated health warnings that reflect the latest scientific evidence are recommended for vapour products and their packaging so that health harms are communicated effectively.**

### **Comprehensive Review of Available Scientific Evidence Required**

There has been a concerted effort to increase the body of scientific evidence available to assess the potential harms and potential benefits associated with vapour products, in an attempt to keep up with the ever-expanding vapour product market. The increase in the availability of vapour products by youth and young adults combined with the apparent belief and pervasive messaging found online that “less harmful” means that vapour products are safe is a significant public health concern. Since the release of the 2018 NASEM publication, researchers have developed a greater understanding of the potential harms associated with e-cigarette use, including health harms from dual use of vapour products and cigarettes, and greater clarity regarding vapour products and their role in smoking cessation. Messaging available on Health Canada web pages require review and revision to incorporate findings from the growing body of scientific evidence, and this scientific evidence should be used to inform Health Canada’s regulatory approach to vapour products.

- ***Dual use of combustible cigarettes and e-cigarettes is common and harmful.***

Health Canada’s webpage on Vaping and Quitting Smoking (2020) states that if an individual completely switches from smoking cigarettes to using vapour products, the individual will experience short-term general health improvements. The challenge with this messaging is that research has shown that in Canada, 38% of Canadian vapers are people who both smoke cigarettes and vape (PSC, 2021). In addition, the 2020 Canadian Tobacco and Nicotine Survey results showed that although youth and young adults between the ages of 15 and 24 made up only 15% of the surveyed population, they represented 40% of those who reported that they vape. The emphasis on the harm reduction approach clouds the fact that there is scientific consensus that using both vapour products and conventional cigarettes is likely more harmful than only smoking or only using vapour products (PSC, 2022), and youth and young adults are then more susceptible to trying vapour products because ‘they aren’t as bad as smoking’.

▪ ***E-cigarettes cause damage to respiratory and circulatory systems.***

The available scientific evidence regarding the impact of vapour product use on respiratory and circulatory systems has increased substantially, with hundreds of studies examining the health harms in laboratory studies of both animals and humans.

- Researchers have concluded that the damage caused by vapour products leads to lung and heart disease and stroke (Keith and Bhatnagar, 2021). Vapour product use may also compromise the ability to remove microbial pathogens, increasing the risk of infection from viruses, fungi and bacteria (Keith and Bhatnagar, 2021).
- In another comprehensive review of cardiovascular effects, findings from Buchanan and colleagues (2020) suggest that vapour product use is associated with inflammation, oxidative stress and haemodynamic imbalance increasing the risk of cardiovascular disease (Buchanan et al., 2020).
- In a review of 38 studies measuring cardiovascular effects of e-cigarettes, “most studies suggest potential for cardiovascular harm from electronic cigarette use, through mechanisms that increase risk of thrombosis and atherosclerosis” (Kennedy et al, 2019).
- A 2020 review and meta-analysis of vapour product impact on lung health showed that e-cigarette use was associated with a 39% increase in the risk of asthma and a 51% increase in the risk of developing chronic obstructive pulmonary disease; studies conducted within laboratories showed influence on biological processes that contribute to respiratory harm and illness (Wills et al., 2020).
- According to Lauren Davis and colleagues (2022), based upon a review of the pulmonary effects of long-term vaping product use, they conclude that e-cigarette use is “...likely to result in irreversible parenchymal lung tissue damage and impaired gas exchange, contributing to chronic lung conditions in long-term vapers”.

▪ ***There is insufficient evidence to support/promote vapour products as a cessation tool when sold and regulated as a consumer product.***

Health Canada’s web page on [Vaping and Quitting Smoking](#) reads that “quitting smoking can be difficult, but it is possible. Vaping products and e-cigarettes deliver nicotine in a less harmful way than smoking cigarettes”. The web page further states that “while evidence is still emerging, some evidence suggests that using e-cigarettes is linked to improved rates of success” (Health Canada, 2020). There has been a growing body of scientific evidence to evaluate the effectiveness of vapour products to help those addicted to tobacco to quit, with mixed results. Physicians for a Smoke-Free Canada (2021) compiled a [summary](#) of scientific reports published after both the release of NASEM (2018) and the release of the European Union’s scientific advisors “[Final Opinion on Electronic Cigarettes](#)” (2021). The following conclusions were drawn that warrant further investigation by Health Canada:

- Published studies to date, including longitudinal data analysis, randomized control trials and meta-analysis of e-cigarettes as consumer products (i.e. not regulated or monitored in a clinical setting), when dual use of smoking and vaping was assessed, found high levels of dual use. Further, those that successfully quit smoking had a high prevalence of sustained use of e-cigarettes (PSC, 2021).
- Vapour products may be helpful as smoking cessation aids, but the available evidence indicates that this is only observed in clinical settings with strict product oversight. Vapour products may have the potential to be as effective as other approved methods for cessation (e.g. nicotine replacement therapy, varenicline, bupropion, etc.); however, they do not meet minimum threshold levels for safety for widespread use. In Canada, vapour products are regulated, marketed and sold as a consumer product, not a drug. Due to the high risk of dual use, sustained addiction to vapour products, growing scientific consensus regarding respiratory and cardiovascular harms associated with use, and the high risk of uptake of vapour products by never smokers, a precautionary approach remains prudent (PSC, 2021).

At present, vaping products have not been approved by Health Canada as a smoking cessation aid because they are not currently tested, manufactured, and regulated as such in Canada. Therefore, until an intensive review of the latest evidence is completed, Health Canada's messaging is confusing and contributing to misperceptions of perceived product safety.

- **FDA action against JUUL raises public health concerns about product safety and the industry role in creating a new generation of people addicted to nicotine.**

On June 23, 2022, the FDA issued market denial orders (MDOs) banning the sale of all JUUL products in the United States of America. This announcement makes clear that the US government is not satisfied that JUUL products are safe enough to remain on the market without damaging US public health generally, and that the government is convinced that JUUL products have played a lead role in the dramatic increase in youth vaping. The action employed by the FDA warrants careful consideration and analysis by Health Canada. Given JUUL's dominance within the vapour product market in Canada and the attention that JUUL products have had by the FDA, it calls into question the safety of the other vapour products available for sale that have not had careful analysis or government review. A more rigorous approach, requiring vapour product manufacturers to prove the safety and efficacy of their products prior to sale may be warranted.

**The Middlesex-London Health Unit recommends that Health Canada takes meaningful action to determine the exact consequences on public health that may be caused by the use of vapour products. The Middlesex-London Health Unit encourages Health Canada to publish peer-reviewed evidence of the safety of all types of vaping products within six (6) months. Based on the results of the comprehensive evidence review, Health Canada's messaging on vaping and the safety of vapour products requires review and revision to incorporate all available evidence for public consumption and comprehension. If vapour products are deemed to be safe for continued sale, it is recommended that Health Canada reconsider its regulatory approach, implementing reforms to meaningfully prevent youth, young adult and non-smoker uptake and to prevent health harms from vapour product use and nicotine addiction.**

## References

- Al-Hamdani, M., Hopkins, D. B., & Davidson, M. (2021). *The 2020-2021 Youth and Young Adult Vaping Project*. The Lung Association, Smoke-Free Nova Scotia and the Heart and Foundation of Canada.  
<https://www.heartandstroke.ca/-/media/pdf-files/get-involved/yyav-full-report-final-eng-24-3-2021.ashx>
- Anderson, P., Chisholm, D., & Fuhr, D. C. (2009) Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *Lancet*, 373(9682), 2234-2246. DOI: 10.1016/S0140-6736(09)60744-3
- Bennett, M., Hair, E. C., Liu, M., Pitzer, L., Rath, J. M., & Vallone, D. M. (2020). Exposure to tobacco content in episodic programs and tobacco and e-cigarette initiation. *Preventive Medicine*, 139, 106169.  
 DOI: [10.1016/j.ypmed.2020.106169](https://doi.org/10.1016/j.ypmed.2020.106169)
- Buchanan, N. D., Grimmer, J. A., Tanwar, V., Schwieterman, N., Mohler, P. J., & Wold, L. E. (2020) Cardiovascular risk of electronic cigarettes: A review of preclinical and clinical studies. *Cardiovascular Research*, 116(1), 40-50.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8204488/>
- Centers for Disease Control and Prevention (CDC). (2022, March 14). *National Youth Tobacco Survey (2011-2021)*.  
[https://www.cdc.gov/TOBACCO/data\\_statistics/surveys/NYTS/index.htm](https://www.cdc.gov/TOBACCO/data_statistics/surveys/NYTS/index.htm)
- Corrigan, J. R., Hackenberry, B. N., Lambert, V. C., Rousu, M. C., Thrasher, J. F., & Hammond, D. (2021). Estimating the price elasticity of demand for JUUL e-Cigarettes among teens. *Drug and Alcohol Dependence*, 218, 108406. <http://davidhammond.ca/wp-content/uploads/2018/03/2020-JUUL-Price-Elasticity-DAD-Corrigan-et-al.pdf>
- Dalton, M. A., Sargent, J. D., Beach, M. L., Titus-Ernstoff, L., Gibson, J. J., Ahrens, M. B., Tickle, J. J., Heatherton, T. F. (2003) Effect of viewing smoking in movies on adolescent smoking initiation: A cohort study. *Lancet*, 362(9380), 281-285. DOI: [10.1016/S0140-6736\(03\)13970-0](https://doi.org/10.1016/S0140-6736(03)13970-0)
- Davis, L., Sapey, E., Thickett, D. R., & Scott, A. (2022). Predicting the pulmonary effects of long-term e-cigarette use: are the clouds clearing? *European Respiratory Review*, 31, 210121.  
<https://err.ersjournals.com/content/31/163/210121>
- Diaz, M. C., Donovan, E. M., Schillo, B. A., & Vallone, D. (2021). Menthol e-cigarette sales rise following 2020 FDA guidance. *Tobacco Control*, 30(6), 700-703. DOI: [10.1136/tobaccocontrol-2020-056053](https://doi.org/10.1136/tobaccocontrol-2020-056053)
- European Union Committee, Scientific Committee on Health, Environmental and Emerging Risks. (2021). *Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions* (Document 52016DC0805). European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1621500846386&uri=COM%3A2021%3A249%3AFIN>
- Feighery, E. C., Ribisl, K. M., Schleicher, N. C., Zeller, L., & Wellington, N. (2005). How do minimum cigarette price laws affect cigarette prices at the retail level? *Tobacco Control*, 14(2), 80-85.  
<https://tobaccocontrol.bmj.com/content/14/2/80.long>
- Gaiha, S. M., Lempert, L. K., & Halpern-Felsher, B. (2020). Underage youth and young adult e-cigarette use and access before and during the Coronavirus Disease 2019 pandemic- online survey of youth and young adults. *JAMA Network Open*, 3(12), e2027572. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2773494>
- Business Wire. (2022, April). Global e-cigarette market (2022 to 2027) - Industry trends, share, size, growth, opportunity and forecasts - ResearchAndMarkets.com.

<https://www.businesswire.com/news/home/20220401005272/en/Global-E-Cigarette-Market-2022-to-2027---Industry-Trends-Share-Size-Growth-Opportunity-and-Forecasts---ResearchAndMarkets.com>

Gonzalez, J. E. & Cooke, W. H. (2021). Acute effects of electronic cigarettes on arterial pressure and peripheral sympathetic activity in young non-smokers. *American Journal of Physiology: Heart and Circulatory Physiology*, 320, H248–H255. <https://doi.org/10.1152/ajpheart.00448.2020>

Gotts, J.E., Jordt, S-E., McConnell, R., & Tarran, R. (2019). What are the respiratory effects of e-cigarettes? *BMJ*, 366, 15275. <https://www.bmj.com/content/366/bmj.15275>

Grana, R. A. & Ling, P. M. (2014). “Smoking Revolution” a content analysis of electronic cigarette retail websites. *American Journal of Preventive Medicine*, 46(4), 395–403. DOI: [10.1016/j.amepre.2013.12.010](https://doi.org/10.1016/j.amepre.2013.12.010)

Hammond, D., White, C. M., Czoli, C. D., Martin, C. L., Magennis, P., & Shiplo, S. (2015). Retail availability and marketing of electronic cigarettes in Canada. *Canadian Journal of Public Health*, 106(6), e408-412. <http://journal.cpha.ca/index.php/cjph/article/view/5105/3215>

Health Canada. (2021). *Vaping compliance and enforcement report: July 2020 to March 2021*. <https://www.canada.ca/en/health-canada/services/smoking-tobacco/vaping/compliance-enforcement/online-inspections-july-march-2021.html>

Health Canada. (2019). *Canadian Student Tobacco, Alcohol and Drugs (CSTADS) survey 2018-2019*. <https://www.canSada.ca/en/health-canada/services/canadian-student-tobacco-alcohol-drugs-survey/2018-2019-detailed-tables.html>

Health Canada. (2018). *Canadian Student Tobacco, Alcohol and Drugs (CSTADS) survey 2016-2017*. <https://www.canada.ca/en/health-canada/services/canadian-student-tobacco-alcohol-drugs-survey/2016-2017-supplementary-tables.html>

Health Canada. (2022, March). *Vaping and quitting smoking*. <https://www.canada.ca/en/health-canada/services/smoking-tobacco/vaping/smokers.html>

Huang, J., Tauras, J., & Chaloupka, F.J. (2014). The impact and price of tobacco control policies on the demand for electronic nicotine delivery systems. *Tobacco Control*, 23, iii41–iii47. [https://tobaccocontrol.bmj.com/content/tobaccocontrol/23/suppl\\_3/iii41.full.pdf](https://tobaccocontrol.bmj.com/content/tobaccocontrol/23/suppl_3/iii41.full.pdf)

Huynh, D., Huang, J., Le, L. T. T., Liu, D., Liu, C., Pham, K., & Wang, H. (2020). Electronic cigarettes promote the lung colonization of human breast cancer in NOD SCID-Gamma Mice. *International Journal of Clinical & Experimental Pathology*, 13(8), 2075–2081. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7476960/pdf/ijcep0013-2075.pdf>

Keith, R., & Bhatnagar, A. (2021). Cardiorespiratory and immunologic effects of electronic cigarettes. *Current Addiction Reports*, 8(2), 336–346. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7935224/>

Kennedy, C. D., van Schalkwyk, M. C. I., McKee, M., & Pisinger, C. (2019) The cardiovascular effects of electronic cigarettes: A systematic review of experimental studies. *Preventive Medicine*, 127, 105770. DOI: [10.1016/j.ypmed.2019.105770](https://doi.org/10.1016/j.ypmed.2019.105770)

Klein, E. G., Berman, M., Hemmerich, N., Carlson, C., Htut, S., & Slater, M. (2016). Online e-cigarette marketing claims: A systematic content and legal analysis. *Tobacco Regulatory Science*, 2(3), 252–262. <https://doi.org/10.18001/TRS.2.3.5>

Action on Smoking & Health (Alberta), Coalition québécoise pour le contrôle du tabac, Ontario Campaign for Action on Tobacco, & Physicians for a Smoke-Free Canada. (2019). *Canadians support urgent government action to address youth vaping: Leger poll.*

[http://www.cqct.qc.ca/Communiqués\\_docs/2019/PRSS\\_19\\_05\\_09\\_Joint\\_Urgent\\_call\\_for\\_vaping\\_legislation.pdf](http://www.cqct.qc.ca/Communiqués_docs/2019/PRSS_19_05_09_Joint_Urgent_call_for_vaping_legislation.pdf)

Moodie, C., Mackintosh, A. M., Hastings, G., & Ford, A. (2011). Young adult smokers' perceptions of plain packaging: A pilot naturalistic study. *Tobacco Control, 20*(5), 367-73. DOI:10.1136/tc.2011.042911

Morean, M. E., Bold, K. W., Kong, G., Camenga, D. R., Jackson, A., Simon, P., Davis, D. R., & Krishnan-Sarin, S. (2020). High school students' use of JUUL pod flavors before and after JUUL implemented voluntary sales restrictions on certain flavors in 2018. *PLoS ONE, 15*(12), e0243368.

<https://journals.plos.org/plosone/article/metrics?id=10.1371/journal.pone.0243368>

National Academies of Sciences, Engineering and Medicine. (2018). *Public health consequences of e-cigarettes.*

<https://www.nap.edu/catalog/24952/public-health-consequences-of-e-cigarettes>

National Institute on Drug Abuse. (2021). *Monitoring the future.* National Institutes of Health.

<https://nida.nih.gov/drug-topics/trends-statistics/monitoring-future>

O'Connor, S., D'Souza, S., Diemert, L., & Schwartz, R. (2019) *Promotion of flavoured vaping products that appeal to youth.* Ontario Tobacco Research Unit. [https://www.otru.org/wp-content/uploads/2019/04/otru\\_projectnews\\_apr2019.pdf](https://www.otru.org/wp-content/uploads/2019/04/otru_projectnews_apr2019.pdf)

Ontario Tobacco Research Unit (OTRU). (2021). *Youth access to e-cigarettes: Regulatory options and online sales test shop webinar* [Video]. YouTube. <https://www.youtube.com/watch?v=WPQeDXby4zQ>

Physicians for a Smoke-Free Canada. (2022, February 14). Science has marched on: It's time to update the advice to Canadians. <https://smoke-free.ca/science-has-marched-on-its-time-to-update-the-advice-to-canadians/>

Physicians for a Smoke-Free Canada. (2021, April 30). Conclusions from the EU's scientists and others on whether e-cigarettes help smokers quit. <http://smoke-free-canada.blogspot.com/2021/04/the-european-unions-scientific.html>

Physicians for a Smoke-Free Canada. (2021). *Five Insights from National Survey Data: The Canadian Tobacco and Nicotine Survey, 2020-2021.* <http://www.smoke-free.ca/SUAP/2021/CTNS-2020-results.pdf>

Polansky, J.R., Driscoll, D., & Glantz, S. A. (2020). *Smoking in top-grossing US movies: 2019.* Centre for Tobacco Control Research and Education, University of California, San Francisco. <https://escholarship.org/uc/item/86q9w25v>

Smoke Free Media, (2020). *R-rate films with tobacco.* University of California, San Francisco.

<https://smokefreemedia.ucsf.edu/policy-solutions/r-rate>

Smoke-Free Ontario Scientific Advisory Committee, Ontario Agency for Health Protection and Promotion (Public Health Ontario). (2017, April). *Evidence to guide action: Comprehensive tobacco control in Ontario (2016).*

<https://www.publichealthontario.ca/-/media/Documents/C/2017/comprehensive-tobacco-control-2016.pdf>

Tommasi, S., Pabustan, N., Li, M., Chen, Y., Siegmund, K. D., & Besaratinia, A. (2021). A novel role for vaping in mitochondrial gene dysregulation and inflammation fundamental to disease development. *Scientific Reports, 11*,

22773. <https://www.nature.com/articles/s41598-021-01965-1>

Truth Initiative. (2022, January 11). *New Truth Initiative report shows troubling use of tobacco imagery in tv shows, movies and music videos most popular among youth as e-cigarette epidemic persists* [Press release].

<https://truthinitiative.org/press/press-release/new-truth-initiative-report-shows-troubling-use-tobacco-imagery-tv-shows-movies>

U.S. Department of Health and Human Services. (2000). *Reducing tobacco use: A report of the Surgeon General*. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

[https://www.cdc.gov/tobacco/data\\_statistics/sgr/2000/complete\\_report/pdfs/fullreport.pdf](https://www.cdc.gov/tobacco/data_statistics/sgr/2000/complete_report/pdfs/fullreport.pdf)

U.S. Department of Health and Human Services. (2012). *Preventing tobacco use among youth and young adults: A report of the Surgeon General*. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

[https://www.ncbi.nlm.nih.gov/books/NBK99237/pdf/Bookshelf\\_NBK99237.pdf](https://www.ncbi.nlm.nih.gov/books/NBK99237/pdf/Bookshelf_NBK99237.pdf)

U.S. Department of Health and Human Services. (2021, December 7). *Surgeon General issues advisory on youth mental health crisis further exposed by COVID-19 Pandemic* [Press release].

<https://www.hhs.gov/about/news/2021/12/07/us-surgeon-general-issues-advisory-on-youth-mental-health-crisis-further-exposed-by-covid-19-pandemic.html>

U.S. Food and Drug Administration. (2022, June 23). *FDA denies authorization to market JUUL Products* [Press release]. <https://www.fda.gov/news-events/press-announcements/fda-denies-authorization-market-juul-products>

World Health Organization. (2015, October). *Smoke-free movies: From evidence to action* (3<sup>rd</sup> ed.)

<https://www.who.int/publications/i/item/9789241509596>

Williams, R. S., Derrick, J., Liebman, A. K., LaFleur, K., & Ribisl, K. M. (2018). Content analysis of age verification, purchase and delivery methods of internet e-cigarette vendors, 2013 and 2014. *Tobacco Control*, 27(3), 287–293. <https://doi.org/10.1136/tobaccocontrol2016-053616>

Wills, T. A., Soneji, S. S., Choi, K., Jaspers, I., & Tam, E. K. (2020). E-cigarette use and respiratory disorder: An integrative review of converging evidence from epidemiological and laboratory studies. *European Respiratory Journal*, in press. <https://erj.ersjournals.com/content/early/2020/10/15/13993003.01815-2019>

Zare, S., Nemati, M., & Zheng, Y. (2018). A systematic review of consumer preference for e-cigarette attributes: Flavor, nicotine strength, and type. *PLoS ONE*, 13(3), e0194145.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0194145>