THE 2024 YOUTH AND YOUNG ADULT VAPING PROJECT: FINDINGS FROM NOVA SCOTIA

Final Report

Prepared by: Myles Davidson, MSc, PhD(c)
mylesdavidson@cmail.carleton.ca

February 25, 2025

1 EXECUTIVE SUMMARY

Background: For at least a decade, e-cigarette use (vaping) among youth and young adults (YYAs) has been a significant public health concern. In 2019, the *2019 Youth and Young Adult Vaping Survey* was conducted to better understand vaping behaviour among youth (ages 16-18) and young adult (ages 19-24) regular e-cigarette users in Nova Scotia. Several policy recommendations were generated from this survey, eventually leading the Government of Nova Scotia to introduce a flavour ban, a nicotine concentration cap of 20mg/mL, a vaping product taxation increase, strict licensing requirements for vaping retailers, and an advertisement ban. With five years having passed since the introduction of these pieces of legislation, it is necessary to re-examine vaping among Nova Scotia YYAs to determine how the legislation may have impacted vaping trends.

Methods: 380 youth (*n* = 68) and young adult (*n* = 312) vapers (*n* = 279 current vapers, *n* = 101 former vapers) completed an online Qualtrics survey aimed at better understanding vaping behaviour, product preferences, expectancies, advertising and social media exposure to vaping content, tobacco use, nicotine pouch use, and self-reported impact of Nova Scotia's vaping legislation among this demographic. Participants who completed the survey had the chance to win one-of-four $250 CAD Amazon gift cards. Data collected through the survey was analyzed using both quantitative and qualitative data analysis techniques.

Findings: Many of the trends observed in 2019 replicated in this survey. Vaping behaviour patterns remained relatively unchanged. A shift was observed with respect to product preferences in that disposables were now the most used device type, and the average nicotine concentration used decrease substantially from 2019. The use of flavoured vape juice among YYAs remained high. The best and worst aspects of vaping remained relatively unchanged from 2019, as did the experience of negative side-effects from vaping. Exposure to vaping advertisements decreased somewhat from 2019, while social media vaping content exposure remained high. The number of smokers who started to smoke after first vaping was much larger than seen in 2019, with the accessibility of cigarettes relative to vaping products seeming to be a main contributor to this change. Nicotine pouch use was common, with curiosity and the accessibility of nicotine pouches relative to vaping products being cited by many as a main reason for trying them. Lastly, all forms of legislation were reported to have done little to influence the vaping behaviour of participants. Key differences were observed with respect to vaping status and age group for several survey questions.

Conclusions: Very little has changed with respect to YYA vaping in Nova Scotia over the last five years, with many of the problems identified in 2019 continuing to persist. Overall, most of the legislation introduced in Nova Scotia since 2020 appears to have had little impact on the vaping behaviour of YYAs. Some of the more notable findings from this survey highlight the need for comprehensive advocacy efforts to address persisting gaps in legislation and enforcement.

Table of Contents

2 Background

E-cigarette use (vaping) among youth and young adults (YYAs) continues to represent a significant public health concern. In 2019, the Canadian Student Tobacco, Alcohol and Drugs Survey (CSTADS) revealed that the rate of past 30-day vaping among youth in grades 7-12 was 20% [1]. In Nova Scotia, this rate was slightly higher than the national average at 25% [1]. In response to these findings, Smoke-Free Nova Scotia conducted the *2019 Youth and Young Adult Vaping Survey* to better understand vaping behaviour among youth (ages 16-18) and young adult (ages 19-24) regular e-cigarette users in Nova Scotia [2]. The pattern of findings from this survey led to five policy actions being recommended: (1) a full flavour ban, (2) increased taxation on vaping products, (3) stronger enforcement of sales regulations, (4) increasing the minimum legal age of purchasing vaping products to 21, and (5) increasing awareness of the potential for vaping to translate into cigarette smoking.

Beginning in mid-2020, Nova Scotia became one of the first provinces to enact sweeping vaping legislation by announcing the adoption of a flavour ban, a nicotine concentration cap of 20mg/mL, vaping product taxation increases, strict licensing requirements for vaping retailers, and an advertisement ban. With five years having passed since the introduction of these measures, it is necessary to re-examine vaping among Nova Scotia YYAs to determine how the legislation may have impacted vaping trends. While the most recent CSTADS suggests the past 30-day vaping rate among youth in grades 7-12 had decreased slightly to 23% by the end of 2021 [3], it remains unknown how the elements of vaping examined in the *2019 Youth and Young Adult Vaping Survey* have changed. Additionally, as this legislation was introduced at the height of the COVID-19 pandemic (which itself led to a decrease in vaping among this demographic; [4]), it is important to examine whether the changes in vaping patterns observed during the pandemic have persisted or whether they have returned to pre-pandemic levels.

2.1 Aim and Objectives

The aim of the *2024 Youth and Young Adult Vaping Project* was fourfold. First, it served as a direct follow up to the *2019 Youth and Young Adult Vaping Survey* by collecting updated data on the questions asked during this initial survey. Second, it served as an expansion of this initial survey by collecting data on previously unassessed elements of YYA vaping and other tobacco product use in Nova Scotia (e.g., nicotine pouches). Third, it sought to make inferences about the effectiveness of Nova Scotia's vaping legislation by examining changes in vaping trends among YYAs in Nova Scotia over a five-year period. Finally, it aimed to summarize the vaping landscape in Nova Scotia and identify key areas in need of further attention.

3 Methods

A single, comprehensive, cross-sectional survey written in English was created to gain insight into vaping trends among YYA vapers in Nova Scotia. To be eligible to take the survey, prospective participants had to be between the ages of 16 and 24, to have been residing in

Nova Scotia at the time the survey was administered, and either (1) to have currently been using an e-cigarette at least once a week for the past three months consecutively (classified as "current vapers"), or (2) to have formerly used an e-cigarette at least once a week for at least three consecutive months (classified as "former vapers"). This inclusion criteria is consistent with what was used in the 2019 survey [2]. In total, *n* = 68 youth and *n* = 312 young adults (*N* = 380 participants total) completed the survey in its entirety. Of these, *n* = 279 were current vapers, and n = 101 were former vapers.

Participants were recruited online using paid advertisements on Facebook, Instagram, Snapchat, and TikTok. There were two different types of advertisements used. The first was poster style advertisements which depicted an individual of similar age to the target audience and contained messaging about the survey content, who was eligible to take the survey, and the financial incentive for completing the survey. The second was short-form videos depicting the same individual and messaging as the posters with the addition of animations and background music intended to capture the viewer's attention. Anyone interested in learning more about the survey was invited to either scan the QR code depicted in the advertisement or follow the provided link, both of which redirected to a landing page hosted on the LungNSPEI website. This landing page provided additional information about the survey, including the eligibility criteria, the purpose of the survey, the types of information being collected, and what would be done with the findings. Those who chose to participate in the survey at this point were invited to follow a separate link to a Qualtrics survey.

The survey began with an informed consent form describing the research in more detail and providing information about the data being collected, the risks and benefits associated with participation, and other relevant information (e.g., data storage, dissemination of results, etc.). Participants who consented to participating in the research were then invited to complete the remainder of the survey. In addition to basic demographic information, the survey asked about various topics including vaping behaviour, product preferences, expectancies, advertising and social media exposure to vaping content, tobacco use, nicotine pouch use, and self-reported impact of Nova Scotia's vaping legislation. Two additional sets of questions were uniquely given to each vaping group. Current vapers were asked questions pertaining to e-cigarette dependence and sharing, while former vapers were asked questions about their experience with vaping cessation. The survey took approximately 20 minutes to complete. Anyone who completed the survey in its entirety was invited to complete a second Qualtrics survey to enter a gift card draw for one-of-four $250 CAD Amazon gift cards. This study received ethics clearance from the Health Sciences Research Ethics Board at Dalhousie University (REB #2024-7298).

Data collected from the survey were analyzed in three different waves. First, descriptive analyses were carried out for the entire sample. This included generating means and standard deviations, as well as frequencies and percentages, for all study variables. Open-ended questions related to advertising and social media exposure to vaping content were analyzed using a content analysis, a statistical technique consisting of coding open-ended responses into themes and quantifying the number of times each theme appears in the data [5]. Second, group comparisons were drawn between current and former vapers using a series of independent

samples *t*-tests and chi-square tests of independence. Third, group comparisons were drawn between YYAs using a separate series of independent samples *t*-tests and chi-square tests of independence. All analyses were conducted using SPSS Version 29.

4 Findings

4.1 Demographics

Table 1 depicts the demographic information for the total sample. The average age of participants in the sample was 20.73 (*SD* = 2.25). Most of the sample was comprised of young adults (*n* = 312, 82.1%) and current vapers (*n* = 279, 73.4%), as well as those who were female (*n* = 266, 70.2%), who identified as a woman (*n* = 248, 65.2%), who were heterosexual/straight (*n* = 226, 59.5%), and who were of European descent (*n* = 266, 70.0%). The largest proportion of the sample came from either a city (*n* = 111, 29.2%) or a town or village (*n* = 102, 26.8%). Approximately three-quarters of the sample were currently employed (*n* = 283, 74.5%). In terms of overall health, the largest proportion of participants rated their physical health as good (*n* = 162, 45.1%) and their mental health as fair (*n* = 140, 36.8%). Regarding substance use behaviour, about three-quarters reported alcohol use in the last month (*n* = 289, 76.5%), while about two-thirds reported cannabis use in the last month (*n* = 241, 63.8%).

Tables 1A and 1B depict the demographic information split by vaping status and age group, respectively. There were no demographic differences identified based on vaping status. However, several age differences were identified. First, there was a significant difference between YYAs with respect to sex, $\chi^2(1, n = 379) = 6.97$, $p = .03$, Cramer's $V = 0.14$, with males being significantly overrepresented in the youth group and females being significantly overrepresented in the young adult group. Second, there was a significant difference between YYAs with respect to belonging to an African culture, $\chi^2(1, n = 380) = 18.14$, $p < .001$, Cramer's $V = 0.22$, with significantly more youth reporting African origins than young adults. Third, there was a significant difference between YYAs with respect to belonging to an Indigenous Canadian culture, $\chi^2(1, n = 380) = 12.94$, $p < .001$, Cramer's $V = 0.19$, with significantly more youth reporting Indigenous Canadian origins than young adults. Finally, there was a significant difference between YYAs regarding employment status, $\chi^2(1, n = 380) = 26.09$, $p < .001$, Cramer's $V = 0.26$, with a significantly larger proportion of young adults reporting being currently employed versus youth.

Table 2 presents the postal codes collected as part of the survey, as well as the number of participants from each postal code. In total, there were 64 unique postal codes from which individuals participated. Of these, 18 were from the Eastern Health Zone (28.1%), five were from the Northern Health Zone (7.8%), 28 were from the Central Health Zone (43.8%), and 13 were from the Western Health Zone (20.3%). The postal code with the largest total number of participants was B3H, corresponding to south-end Halifax.

4.2 Vaping Behaviour

Table 3 depicts the results of the vaping behaviour questions for the total sample. The mean age at first use for the sample was 15.42 (*SD* = 2.17). In general, participants vaped virtually every day (*M* = 6.70, *SD* = 0.95), approximately 56 unique times per day (*SD* = 65.35), and took approximately five puffs per vaping episode (*SD* = 6.63). The average number of quit attempts for the whole sample was 3.44 (*SD* = 3.27). In terms of spending, participants reported spending an average of $28 per week on vaping (*SD* = 36.27). Youth participants were asked whether their parents knew of their vaping behaviour, of which half (*n* = 16, 50%) reported their parents were aware. The strongest influence to start vaping reported by participants was friends (*n* = 222, 58.4%). Most of the sample purchased their vaping products themselves (*n* = 306, 80.5%) and used money from a job to purchase them (*n* = 313, 85.8%). Of those who bought their own devices and e-juice, the largest proportion did so at specialty vape shops in Nova Scotia (*n* = 144, 47.0% and *n* = 114, 37.6%, respectively). Of those who did not buy their own products, most had a friend who was of legal age purchase their products for them (*n* = 41, 69.5%). These individuals most often accessed the devices and e-juice at specialty vape shops in Nova Scotia (*n* = 24, 40.6% and *n* = 19, 32.1%, respectively).

Table 3A depicts the results from the vaping behaviour questions asked only to current vapers. On the E-Cigarette Dependence Scale [6], participants scored 1.36 on average (*SD* = 0.84) out of a maximum of 5, suggesting low dependence. When asked whether they found it hard to vape where not permitted, most participants said no (*n* = 151, 54.1%). With respect to peer-pressure, most participants reported not having experienced peer pressure to vape (*n* = 184, 65.9%). Regarding sharing behaviours, almost all participants reported offering to share their vaping device with someone else (*n* = 263, 94.3%) and having had someone else offer up their vaping device for the participant to use (*n* = 272, 97.5%). About two-thirds had tried to quit vaping at least once (*n* = 188, 67.4%). Of the current vapers who were also youth, only a few reported that they purchased their vaping products close to their school (*n* = 5, 20.8%). Of these, most purchasing locations were within walking distance of the school (*n* = 3, 60.0%). No group differences with respect to age emerged for these questions.

Table 3B depicts the results from the vaping behaviour questions asked only to former vapers. The number of vaping quit attempts undertaken by participants before being successful ranged from 0-20, with the average being 3.63 (*SD* = 3.62). The largest proportion of participants in the sample were in maintenance for less than one year (*n* = 42, 41.6%), with the second largest proportion being in maintenance for over one year (*n* = 36, 35.6%). With respect to the quit method used, the most common was quitting cold turkey or unassisted (*n* = 45, 45.0%). The most commonly cited reason for quitting was the possible long-term health effects associated with vaping (*n* = 36, 35.5%), followed closely by negative side-effects (*n* = 23, 22.8%). When asked who was helpful in them being able to successfully quit, the largest proportion of participants said no one (*n* = 39, 38.6%), followed closely by friends (*n* = 34, 33.7%). Regarding relapse triggers, the most common triggers participants selected were sensory vaping cues (*n* = 61, 60.4%), stress/anxiety (*n* = 59, 58.4%), and other substance use (*n* = 44, 43.6%). Finally, with respect to potential services that would help others quit vaping, most participants endorsed free nicotine replacement therapy (NRT) as the best service (*n* = 69, 68.3%), with a large proportion also selecting text-message-based supports (*n* = 45, 44.6%). No group differences with respect to age emerged for these questions.

4.2.1 Vaping Behaviour by Vaping Status

Table 3C depicts the results of the vaping behaviour questions split by vaping status. Several notable differences in vaping behaviour emerged based on vaping status. First, there was a significant difference between groups for age of first use, $t(213.48) = -2.40$, $p = .02$, 95% *CI* [-0.99, -0.10], $d = 0.25$, in that current vapers started vaping significantly younger than former vapers. Second, there was a significant difference between groups for vaping episodes per day, $t(340.81) = 2.76$, $p = .01$, 95% *CI* [9.18, 54.68], $d = 0.24$, in that current vapers vaped significantly more times per day than former vapers. Third, there were significant differences between current and former vapers with respect to the strongest influence to start vaping, $\chi^2(6, n = 380) = 16.59$, $p = .01$, Cramer's $V = 0.21$, with a significantly larger proportion of former vapers reporting family, friends, and being unsure as their strongest influence compared to current vapers. Fourth, there was a significant difference between current and former vapers with respect to method of access, $\chi^2(2, n = 380) = 13.19$, $p = .001$, Cramer's $V = 0.19$, with a significantly larger proportion of current vapers reporting having someone else purchase their vaping products for them compared to former vapers. Finally, there were significant differences between current and former vapers with respect to where someone else buys their devices for them, $\chi^2(6, n = 59) = 16.41$, $p = .01$, Cramer's $V = 0.48$. Of those who had someone else buy their devices for them, a significantly larger proportion of former vapers reported that the person bought them at speciality vape shops in Nova Scotia, while a significantly larger proportion of current vapers reported that the person bought them from an online speciality vape shop outside of Nova Scotia. The large Cramer's *V* value suggests this is a particularly large difference.

4.2.2 Vaping Behaviour by Age

Table 3D depicts the results of the vaping behaviour questions split by age. Several notable differences in vaping behaviour emerged based on age. First, there was a significant difference between YYAs with respect to age of first use, $t(374) = -9.93$, $p < .001$, 95% *CI* [-3.06, -2.05], $d = 1.33$, with youth starting to vape significantly younger than young adults. The large Cohen's *d* value suggests this is a particularly large difference. Second, there was a significant difference between YYAs with respect to method of access, $\chi^2(2, n = 378) = 91.30$, $p < .001$, Cramer's $V = 0.49$, with a significantly larger proportion of youth having someone else buy their products for them compared to young adults. The large Cramer's *V* value suggests this is a particularly large difference. Third, there was a significant difference between YYAs with respect to the source of money for vaping products, $\chi^2(2, n = 363) = 27.99$, $p < .001$, Cramer's $V = 0.28$, with a significantly larger proportion of young adults getting it from a job compared to youth. Fourth, there was a significant difference between YYAs with respect to the location where they purchased their devices, $\chi^2(7, n = 305) = 19.46$, $p = .01$, Cramer's $V = 0.29$, with a significantly larger proportion of youth purchasing them from someone they knew compared to young adults. Finally, there was a significant difference between YYAs with respect to the location where they purchased their e-juice, $\chi^2(7, n = 303) = 26.11$, $p < .001$, Cramer's $V = 0.34$, with a significantly larger proportion of youth purchasing it from someone they knew compared to young adults.

4.3 Product Preferences

Table 4 depicts the results of the product preferences questions for the total sample. In terms of device type used, the largest proportion of participants reported using pod-based devices at uptake ($n = 178$, 47.0%). At present or at the time of cessation, however, most were using disposable devices ($n = 214$, 65.6%). Of those who primarily used pod-based devices, the average number of pods consumed per week was 2.64 ($SD = 2.57$), while the average number

of disposables consumed per week for those using primarily that form of device was just under 1 (*SD* = 0.66). Most participants reported using e-juice with nicotine at both uptake (*n* = 329, 86.6%) and at present or at the time of cessation (*n* = 346, 91.3%). The largest proportion of respondents also reported using between 20-35mg/mL of nicotine on average at both uptake (*n* = 113, 34.3%) and at present or at the time of cessation (*n* = 187, 54.0%). Almost all participants reported using flavoured e-juice both at uptake (*n* = 363, 95.5%) and at present or at the time of cessation (*n* = 340, 89.5%). Of those using flavours, the largest proportion sourced them from a specialty vape shop in Nova Scotia (*n* = 124, 36.6%).

Table 4A depicts the most common device brands used as reported by participants. In total, 47 unique device brands were identified by participants. Of these, STLTH was the most frequent brand used, with 114 participants citing it as their most used brand (30.0%). The next most used brand was UWell/Caliburn (*n* = 48, 12.6%), followed by ELFBAR (*n* = 38, 10.0%), SMOK (*n* = 26, 6.8%), and Vuse (*n* = 15, 3.9%). 22 participants (5.8%) mentioned that they did not use one specific brand more often than another and instead cycled between various brands.

Participants who reported using flavours either at present or at cessation were also asked to disclose which flavours they most commonly used. In total, there were over 50 unique flavours identified. The most common flavour used by participants was blue raspberry (*n* = 68, 20.0%), followed by menthol (*n* = 39, 11.5%), peach (*n* = 36, 10.6%), strawberry (*n* = 24, 7.1%), and mango (*n* = 19, 5.6%).

4.3.1 Product Preferences by Vaping Status

Table 4B depicts the results of the product preferences questions split by vaping status. One notable difference in vaping behaviour emerged based on vaping status. Specifically, a significant difference was identified between current and former vapers with respect to initial vaping content, $\chi^2(5, n = 380) = 11.78$, $p = .04$, Cramer's $V = 0.16$, in that a significantly larger proportion of former vapers reported being unsure of what was in their initial vape juice compared to current vapers.

4.3.2 Product Preferences by Age

Table 4C depicts the results of the product preferences questions split by age. Several notable differences in vaping behaviour emerged based on age. First, there was a significant difference between YYAs with respect to first device used, $\chi^2(4, n = 377) = 20.39$, $p < .001$, Cramer's $V = 0.23$, with a significantly larger proportion of young adults starting with mods as compared to youth. Second, there was a significant difference between YYAs with respect to initial use of flavours, $\chi^2(1, n = 378) = 4.31$, $p = .04$, Cramer's $V = 0.11$, with a significantly larger proportion of young adults starting to vape using flavours as compared to youth. Finally, there was a significant difference between YYAs with respect to the source of flavoured vape juice, $\chi^2(7, n = 338) = 26.97$, $p < .001$, Cramer's $V = 0.31$, with a significantly larger proportion of youth sourcing flavoured vape juice from someone they knew as compared to young adults.

4.4 Expectancies

Table 5 depicts the results of the expectancies questions for the total sample. With respect to the best aspects of vaping, the largest proportion of participants identified the mood enhancement capabilities of vaping (*n* = 147, 39.0%), followed by nicotine rush (*n* = 105, 27.9%) and flavours (*n* = 36, 9.4%). Regarding the worst aspects, the largest proportion of participants noted the potential long-term health effects of vaping (*n* = 125, 32.9%), followed by negative side-effects (*n* = 76, 20.0%) and addiction (*n* = 71, 18.7%). When asked about side-effects, most participants reported they had experienced at least one (*n* = 204, 53.7%). Of these, both respiratory (*n* = 142, 69.6%) and nicotine-related (*n* = 148, 72.5%) side-effects were common.

4.4.1 Expectancies by Vaping Status

Table 5A depicts the results of the expectancies questions split by vaping status. One notable difference in expectancies emerged based on vaping status. Specifically, there were significant differences between current and former vapers with respect to the best aspects of vaping, $\chi^2(10, n = 377) = 21.73$, $p = .02$, Cramer's $V = 0.22$, with a significantly larger proportion of current vapers reporting vaping as a smoking alternative and discreetness as the best aspect compared to former vapers, and a significantly larger proportion of former vapers reporting head rush as the best aspect compared to current vapers.

4.4.2 Expectancies by Age

Table 5B depicts the results of the expectancies questions split by age. No differences in expectancies emerged based on age.

4.5 Advertising and Social Media

Table 6 depicts the results of the advertising and social media questions for the total sample. With respect to advertising, over half the sample reported having never been exposed to a vaping advertisement (*n* = 224, 58.9%). Of those that had been exposed to one, the most common platforms for exposure were Instagram (*n* = 85, 54.5%), TikTok (*n* = 71, 45.5%), and Facebook (*n* = 59, 37.8%). These advertisements most often came from vaping brands (e.g., STLTH; *n* = 108, 69.2%). Regarding social media vaping content exposure (non-advertising), most of the sample reported seeing vaping-related content on social media (*n* = 221, 58.2%). Of those that did, the most common platforms for exposure were TikTok (*n* = 185, 83.7%), Instagram (*n* = 148, 67.0%), and Snapchat (*n* = 140, 63.3%). This social media content most often came from influencers (*n* = 150, 67.9%) and friends (*n* = 124, 56.1%). However, a sizeable number of participants also reported exposure to content from health promotion organizations (*n* = 67, 30.3%) and the government (*n* = 47, 21.3%).

Table 6A provides a breakdown of the content depicted in the advertising and social media posts participants were exposed to, as well as the frequency of each type of exposure. For advertising, six distinct types of advertisements were identified. The most common type of

advertising content was advertisements for specific device brands (e.g., STLTH; *n* = 49, 47.6%). Next was health promotion content such as anti-vaping PSAs, as well as pro-vaping organizations promoting the safety of vaping relative to smoking (*n* = 11, 10.7%), followed next by influencers advertising products as part of sponsorships (*n* = 11, 10.7%). The fourth most common type of content was advertisements for flavoured vaping products specifically (*n* = 8, 7.8%). Next was retailers (such as specialty vape shops) advertising the products they had for sale at their location (*n* = 7, 6.8%). The least common type of advertising content came from the friends of participants advertising their own products for sale (*n* = 2, 1.9%). The remainder of the content described by participants could not be used to create meaningful categories and was instead group into "other" (*n* = 15, 14.5%).

For social media content exposure, five distinct types of social media content were identified. The most common type of social media content reported by participants was people posting themselves doing tricks with their vaping device (*n* = 53, 33.8%). Next was content of people just using vaping products on camera, most often in the context of other activities (*n* = 49, 31.2%). The third most common type of content identified was health promotion content such as posts from former vapers about their experiences quitting (*n* = 27, 17.2%). Next was content related to the promotion of vaping such as influencers unboxing new products they had received (*n* = 17, 10.8%). The least common form of social media content reported was internet memes related to vaping (*n* = 7, 4.5%). The remaining responses provided by participants were meaningless and could not be categorized (*n* = 4, 2.5%).

4.5.1 Advertising and Social Media by Vaping Status

Table 6B depicts the results of the advertising and social media questions split by vaping status. Only one notable difference in advertising and social media exposure emerged based on vaping status. Specifically, there was a significant difference between current and former vapers with respect to exposure to ads on websites, $\chi^2(1, n = 156) = 4.16$, $p = .04$, Cramer's $V = 0.16$, with a significantly larger proportion of current vapers being exposed to ads on non-social media websites compared to former vapers. There were no group differences identified with respect to the content of the advertisements and social media posts.

4.5.2 Advertising and Social Media by Age

Table 6C depicts the results of the advertising and social media questions split by age. Several notable differences in advertising and social media exposure emerged based on age. First, there was a significant difference between YYAs with respect to exposure to ads, $\chi^2(1, n = 378) = 6.32$, $p = .01$, Cramer's $V = 0.13$, with a significantly larger proportion of youth being exposed to ads compared to young adults. Second, there was a significant difference between YYAs with respect to advertisement exposure coming from vaping retailers, $\chi^2(1, n = 154) = 6.22$, $p = .01$, Cramer's $V = 0.20$, with a significantly larger proportion of young adults being exposed to ads from retailers compared to youth. Third, there was a significant difference between YYAs with respect to advertisement exposure coming from non-retailers selling vaping products, $\chi^2(1, n = 154) = 10.10$, $p = .001$, Cramer's $V = 0.26$, with a significantly larger proportion of youth being

exposed to ads from non-retailers selling products compared to young adults. Fourth, there was a significant difference between YYAs with respect to social media exposure to vaping content, $\chi^2(1, n = 378) = 11.69$, $p < .001$, Cramer's $V = 0.18$, with significantly more youth being exposed to social media vaping content compared to young adults. Finally, there was a significant difference between YYAs with respect to social media vaping content exposure coming from family, $\chi^2(1, n = 219) = 5.34$, $p = .02$, Cramer's $V = 0.16$, with significantly more young adults being exposed to social media vaping content from family compared to youth. There were no group differences identified with respect to the content of the advertisements and social media posts.

4.6 Tobacco Use

Table 7 depicts the results of the tobacco use questions for the total sample. Most of the sample was comprised of former tobacco users (defined as having tried a tobacco product but not currently using any; *n* = 263, 69.6%), followed by current users (*n* = 65, 17.2%) and never users (*n* = 50, 13.2%). Of those with a history of tobacco use, most had been cigarette users (*n* = 319, 97.3%). Of those who were current tobacco users, the average number of cigarettes smoked per week was approximately 21 (*SD* = 30.34). With respect to the temporal association between smoking and vaping, the largest proportion of those with a history of tobacco use started smoking after vaping (*n* = 139, 42.4%), followed by those who started smoking before vaping (*n* = 105, 32.0%) and those who started concurrently (*n* = 84, 25.6%). Of the current tobacco users who started smoking before vaping, half had tried vaping as a way to quit smoking (*n* = 11, 50.0%). Of the former tobacco users who started smoking before vaping, most had used vaping to quit smoking (*n* = 50, 60.2%). Of those who started smoking after vaping, most endorsed curiosity as the main reason for doing so (*n* = 73, 52.5%), followed by peer-pressure (*n* = 33, 23.7%) and the accessibility of cigarettes relative to vaping products (*n* = 28, 20.1%). Of those who started smoking and vaping concurrently, most endorsed curiosity as the main reason for doing so (*n* = 51, 60.7%), followed by peer-pressure (*n* = 29, 34.5%) and the accessibility of cigarettes relative to vaping products (*n* = 24, 28.6%). Most participants knew of someone who started smoking after vaping (*n* = 214, 56.5%). The most cited reason for this person starting to smoke after vaping was the accessibility of cigarettes relative to vaping products (*n* = 77, 36.0%), followed by the lower cost of cigarettes relative to vaping (*n* = 57, 26.6%) and curiosity (*n* = 56, 26.2%).

4.6.1 Tobacco Use by Vaping Status

Table 7A depicts the results of the tobacco use questions split by vaping status. Several notable differences in tobacco use emerged based on vaping status. First, there was a significant difference between current and former vapers with respect to cigarette use history, $\chi^2(1, n = 328) = 4.36$, $p = .04$, Cramer's $V = 0.12$, with significantly more current vapers having a history of cigarette use compared to former vapers. Second, there were significant differences between current and former vapers with respect to the temporal association between smoking and vaping, $\chi^2(2, n = 328) = 12.53$, $p = .002$, Cramer's $V = 0.20$, with significantly more current vapers starting to smoke after vaping compared to former vapers, and significantly more former

vapers starting to smoke and vape concurrently compared to current vapers. Third, among those who started smoking after vaping, there was a significant difference between current and former vapers with respect to the accessibility of cigarettes being the main reason for doing so, $\chi^2(1, n = 139) = 4.76$, $p = .03$, Cramer's $V = 0.19$, with significantly more former vapers reporting accessibility as the main reason relative to current vapers. Finally, among those who started smoking and vaping concurrently, there was a significant difference between current and former vapers with respect to peer pressure being the main reason for doing so, $\chi^2(1, n = 84) = 4.69$, $p = .03$, Cramer's $V = 0.24$, with significantly more former vapers reporting peer pressure as the main reason compared to current vapers.

4.6.2 Tobacco Use by Age

Table 7B depicts the results of the tobacco use questions split by age. Several notable differences in tobacco use emerged based on age. First, there was a significant difference between YYAs with respect to chewing tobacco use history, $\chi^2(1, n = 327) = 4.37$, $p = .04$, Cramer's $V = 0.12$, with significantly more young adults having a history of chewing tobacco use compared to youth. Second, there was a significant difference between YYAs with respect to knowing someone who smoked after vaping due to peer pressure, $\chi^2(1, n = 214) = 4.95$, $p = .03$, Cramer's $V = 0.15$, with significantly more youth knowing someone who smoked after vaping due to peer pressure compared to young adults. Finally, there was a significant difference between YYAs with respect to knowing someone who smoked after vaping due to the accessibility of cigarettes, $\chi^2(1, n = 214) = 5.90$, $p = .02$, Cramer's $V = 0.17$, with significantly more young adults knowing someone who smoked after vaping due to the accessibility of cigarettes compared to youth.

4.7 Nicotine Pouches

Table 8 depicts the results of the nicotine pouch questions for the total sample. Just under half the sample had tried a nicotine pouch ($n = 179$, 47.1%). Of those who did, the main reason for doing so was curiosity ($n = 140$, 78.2%), followed by a desire to reduce vaping frequency ($n = 57$, 31.8%) and the accessibility of nicotine pouches compared to vaping products ($n = 35$, 19.6%). Just over half the sample reported being exposed to advertisements for nicotine pouches ($n = 209$, 55.1%). Of those who were, most had seen the advertisements either on social media ($n = 171$, 81.8%) or in a physical retail location ($n = 110$, 52.6%).

4.7.1 Nicotine Pouches by Vaping Status

Table 8A depicts the results of the nicotine pouch questions split by vaping status. Only one notable difference in nicotine pouches emerged based on vaping status. There was a significant difference between current and former vapers with respect to trying nicotine pouches for curiosity, $\chi^2(1, n = 179) = 4.25$, $p = .04$, Cramer's $V = 0.15$, with a significantly larger proportion of current vapers having tried nicotine pouches because they were curious compared to former vapers.

4.7.2 Nicotine Pouches by Age

Table 8B depicts the results of the nicotine pouch questions split by age. No differences in nicotine pouches emerged based on age.

4.8 Impact of Legislation

Table 9 depicts the results of the impact of legislation questions for the total sample. These questions asked participants the degree to which each piece of Nova Scotia's vaping legislation had impacted their vaping since being introduced. For the flavour ban, most participants reported that the ban had no impact on their vaping behaviour (n = 288, 76.0%), with only a few stating that it made them vape less (n = 40, 10.5%). For the nicotine concentration cap, most participants reported that the cap had no impact on their vaping behaviour (n = 270, 71.2%), with only a few stating that it made them vape less (n = 27, 7.1%). For the taxation increase, most participants reported that the ban had no impact on their vaping behaviour (n = 264, 69.7%); however, a sizeable proportion did state that it made them vape less (n = 80, 21.1%). Finally, for the vaping advertising ban, most participants reported that the ban had no impact on their vaping behaviour (n = 338, 89.2%), with almost none stating that it made them vape less (n = 11, 2.9%).

4.8.1 Impact of Legislation by Vaping Status

Table 9A depicts the results of the impact of legislation questions split by vaping status. Several notable differences in the impact of the vaping legislation emerged based on vaping status. First, there was a significant difference between current and former vapers with respect to the impact of the flavour ban, $\chi^2(3, n = 379) = 10.13$, $p = .02$, Cramer's $V = 0.16$, with a significantly greater proportion of current vapers reporting that this made them vape more as compared to former vapers. Second, there was a significant difference between current and former vapers with respect to impact of the taxation increases, $\chi^2(3, n = 379) = 16.94$, $p < .001$, Cramer's $V = 0.21$, with a significantly greater proportion of former vapers reporting that this made them vape less as compared to current vapers. Finally, there was a significant difference between current and former vapers with respect to the impact of advertising ban, $\chi^2(3, n = 379) = 10.68$, $p = .01$, Cramer's $V = 0.17$, with a significantly greater proportion of former vapers reporting that this made them vape less as compared to current vapers.

4.8.2 Impact of Legislation by Age

Table 9B depicts the results of the impact of legislation questions split by age. No differences in the impact of the vaping legislation emerged based on age.

5 Key Takeaways and Recommendations

As a reminder, the aim of the *2024 Youth and Young Adult Vaping Project* was to follow-up and expand on the *2019 Youth and Young Adult Vaping Survey* and make inferences about the effectiveness of Nova Scotia's vaping legislation by examining changes in vaping trends among YYAs in Nova Scotia over a five-year period. Overall, the pattern of results observed in this survey is largely consistent with those observed in 2019, suggesting very little change in the vaping landscape in Nova Scotia over the last five years. That said, several novel findings emerged which warrant further discussion. The following section will provide an overall summary of the key findings, as well as recommendations for how to proceed based on these findings.

5.1 Vaping Behaviour – Age 21 Remains Key

In general, the vaping behaviour of the YYAs surveyed approximates the vaping behaviour observed in the 2019 sample, with two notable differences. First, YYAs in this sample vaped more days per week, more times per day, and took more puffs per episode on average compared to YYAs in 2019. While research conducted during the COVID-19 pandemic revealed a decrease in vaping behaviour among Nova Scotian YYAs during this time [4], these findings suggest vaping among this demographic has returned to pre-pandemic levels, perhaps becoming even more severe. Second, the average spending per week on vaping products has almost doubled since 2019, going from $15 per week to $28 per week. This high average spending, coupled with the heavy usage observed, reveals that increasing the cost of entry has done little to dissuade YYAs in Nova Scotia from vaping. As such, a concerted effort must be made to find additional ways to prevent vaping uptake in this demographic aside from simply increasing the price of vaping products.

A principal finding that emerged from this survey with respect to vaping behaviour relates to how vaping products are being accessed by YYAs in Nova Scotia. Despite the plethora of regulations that have been introduced since 2019, and the impact these regulations have had on speciality vape shops, most YYAs in Nova Scotia appear to be accessing vaping products primarily from these shops. This extends to banned products like flavoured vape juice, supporting anecdotal evidence provided by public health officers in Nova Scotia that flavours continue to be sold in speciality vape shops in the province with regularity [7]. One notable finding related to access concerns differences between how current and former vapers accessed vaping products through others. Specifically, current vapers who sourced vaping products through others were more likely to get these products from out of province, whereas former vapers were more likely to get them from within the province. This difference was particularly large and suggests two things at face value. First, current vapers may be making more attempts at circumventing Nova Scotia's legislation to access restricted products like flavoured vape juice as compared to former vapers when they were still vaping. Second, former vapers may have quit vaping because of the restrictions placed on vaping products, thereby explaining why this group was so much less likely to access products from out of province. It is important to note, however, that the data collected in this survey does not allow for either conclusion to be drawn definitively.

An additional key finding observed in this survey was that both current vapers and youth started vaping significantly younger than former vapers and young adults, with the difference between YYAs being particularly large. The most front facing explanation of these findings is that the age of vaping onset is trending younger over time. In fact, the average age of onset in this sample was slightly younger than that observed in 2019. Furthermore, an examination of CSTADS data reveals the prevalence of vaping among those aged 16 and under has been steadily increasing since 2015 [3]. Future research is needed to determine whether the age of vaping onset is in fact trending younger over time or if this is simply a one-time finding. Nonetheless, this finding further reinforces the importance of early interventions to prevent vaping uptake among youth, especially interventions introduced prior to high school (such as Prince Edward Island's Youth Vaping Awareness Days).

An important finding also emerged with respect to age differences. While young adults in this sample most often accessed vaping products themselves, youth were found to most often access vaping products through legal aged peers. This finding is notable as it provides further evidence for the need to consider Age 21 as a legislative avenue in Nova Scotia. It is believed that raising the legal age of purchasing vaping products will make youth less likely to initiate vaping as youth are less likely to have friends who are 21 than they are friends who are 18 or 19 [8]. Past research on smoking has revealed that increasing the legal purchasing age from 18 to 21 would likely reduce youth smoking rates by over 20% [9-10]. In fact, jurisdictions that have increased the legal smoking age to 21 have seen drastic decreases in their youth smoking prevalence rates [11]. While no studies have yet examined the impact of increasing the legal age of vaping to 21, past research has shown that youth perceive their access to vaping products as much lower when the legal purchasing age is higher [12]. As such, Age 21 should be strongly considered as a potential way forward in Nova Scotia to limit the ability of youth to access vaping products.

With respect to the questions asked to current vapers, most of trends remain unchanged from 2019. Both peer-pressure to vape and sharing behaviour remain high, and the biggest influences to start vaping have not changed. A novel question asked in this survey concerned the proximity to schools that youth participants accessed their vaping products. Results of these questions revealed that most youth were not accessing vaping products close to their school. This suggests that the proximity of vaping retailers relative to schools does not appear to be a driving force behind the high rates of youth vaping observed in Nova Scotia.

As former vapers were not included in the 2019 survey, the oldest comparison data comes from a 2020 survey done with former vapers in Nova Scotia [13]. In general, the pattern of findings between this 2020 study and the present study are consistent. A novel question asked in this survey that was not previously assessed concerns resources that former vapers believe could help current vapers quit. The most endorsed resources were free NRT and text-message-based support services. Past research has revealed that both free NRT [14] and text-message-based programs [15] are effective at promoting vaping cessation. As such, these resources should be made accessible to young vapers in Nova Scotia to promote cessation among those who are motivated to quit.

5.2 Product Preferences – Changes in Market Trends, but Flavours Still King

Many of the trends observed in 2019 with respect to product preferences have remained unchanged over the last five years. For instance, the use of flavours remains as prevalent as in 2019, and the top flavours remain unchanged, suggesting the flavour ban has had minimal impact on the accessibility of flavours. Additionally, even though significantly more young adults started vaping using flavours compared to youth, it is important to note that most youth still started vaping using flavours. Overall, this provides evidence that more work is needed to combat the issue of flavoured vape juice in Nova Scotia, including better enforcement of existing regulations.

Despite the consistency in trends over time, there were several notable findings that illustrate a shift in the vaping landscape since 2019. First and foremost, the most common types of devices used in 2019 were overwhelmingly pod-based devices. In 2024, we are observing a shift toward predominantly disposable vaping devices. Given the popularity of these devices and their environmental impact in comparison to reusable devices, this should be a target going forward. Since disposable vapes are considered single-use plastics [16], one avenue of advocacy may be through the existing single-use plastics ban and making a push to include disposable vapes under the ban.

A second notable shift from 2019 is the average nicotine concentration being used by YYAs. Although nicotine use remains common at uptake and at present/at the time of cessation, the average nicotine concentration appears to have dropped over time. More specifically, most participants surveyed in 2019 were using 50-60mg/mL of nicotine both at uptake and at the time of the survey. Now in 2024, the largest proportion of participants reported using 20-35mg/mL both at uptake and most recently/at the time of cessation. This provides face value support for the effectiveness of the federal and provincial nicotine concentration caps. However, since the degree to which the nicotine caps influenced the average nicotine concentration used by participants was not directly assessed in this survey, it can only be inferred using the data collected.

Finally, since the 2019 survey did not ask participants to disclose which vaping device brands they most commonly used, this information was gathered in the current survey. Results demonstrate that the market in Nova Scotia is dominated primarily by a few brands. More specifically, STLTH, UWell/Caliburn, ELFBAR, SMOK, and Vuse were identified as the brands most commonly used by most participants. Future research should examine what makes these brands most desirable to YYA vapers, as well as whether these brands are more accessible to this demographic than their competitors. Furthermore, future advocacy efforts should focus on targeting these brands due to their popularity among young people, similar to what was done with JUUL in the past.

5.3 Expectancies – Perceptions of Vaping Have Shifted

One of the notable changes from 2019 was in the way YYAs perceive vaping. For instance, in 2019, the top three best aspects of vaping according to YYAs were nicotine rush, the positive social aspects of vaping, and vaping as a smoking alternative. By contrast, the top three best aspects of vaping reported by participants in this survey were mood enhancement, nicotine rush, and flavours, with very few responding with vaping as a smoking alternative. The notable difference between these surveys is the relative unimportance of vaping as a smoking alternative in this survey compared to the 2019 survey, suggesting that fewer YYAs are perceiving vaping as a smoking alternative compared to the number who did so in the past.

By contrast, the experience of vaping side-effects among YYA vapers did not change from 2019. As was the case in 2019, most of the YYAs in this sample had experienced a side-effect from vaping. Furthermore, the prevalence of respiratory, nicotine-related, and general side-effects largely mirrored those seen in 2019. As such, the shift in product preferences and overall vaping patterns do not appear to have impacted the prevalence of vaping-related side-effects.

5.4 Advertising and Social Media – Exposure Continues to be Common

With respect to vaping advertising, there were a few key findings identified in this survey. First, the prevalence of vaping advertising exposure dropped from 2019, with less than half of participants in this sample reporting advertising exposure compared to more than half who did so in 2019. At face value, this suggests the advertising ban on vaping has had some effect. That said, almost half this sample still reported advertising exposure. As such, there remains much room for improvement with respect to the effectiveness of the advertising ban. Since most of the advertising exposure occurred through social media and very little through alternative forms of advertising (including advertisements at point-of-sale), this should be the focus going forward.

Regarding social media content exposure, many of the trends observed in 2019 replicated, including the type of content most often encountered. It was unsurprising that most YYAs in the sample had seen vaping content on social media. In general, most of this content tends to be of individuals using vaping products, and the vaping is not typically central to the content being consumed. Vaping influencers appear to have a significant reach in the social media space as they were reported as being frequently encountered by YYAs in this sample. As such, additional advocacy efforts are needed to limit the reach of influencers in targeting young people with vaping-related content. One positive finding that emerged relating to social media vaping content was the prevalence of health promotion and government content related to vaping awareness. Compared to 2019 where this type of content was rarely encountered, a sizeable number of participants in this sample reported encountering it, suggesting gains are being made with respect to the reach of health promotion content. It is important to continue making progress on this front.

The platforms where advertising and social media content were most often encountered differed somewhat between 2019 and this survey. Most notably was the rise of TikTok. In 2019, TikTok was a relatively new platform that was not widely used in Canada. However, it is now the most common platform for social media exposure to vaping content and the second most common

platform for vaping advertising exposure. Furthermore, as was the case in 2019, Instagram remains a common avenue for exposure to both types of vaping content. Based on these findings, these two platforms should be the focus of online advocacy efforts going forward. It is necessary to combat the large amount of vaping content on these platforms with an increase in health promotion content being distributed via these channels.

A central finding relating to advertising and social media is that youth were significantly more likely to be exposed to vaping advertisements and social media vaping content than young adults. This is relatively unsurprising given how many more teens use social media compared to adults [17]. Given this finding, there is a critical need for interventions aimed at educating youth about the importance of being aware of the types of content they may encounter online with respect to vaping, as well as how to make informed choices when interacting with these pieces of content. It is important also to inform youth about potentially misleading information they may encounter online about vaping, especially in advertisements or social media posts promoting vaping products. Of equal importance is the need for further efforts aimed at making youth less likely to encounter this type of content on social media platforms.

5.5 Tobacco Use – Evidence for the Gateway Hypothesis

The questions related to tobacco use returned the most notable findings of the entire survey. Overall, the number of ever-smokers in this sample far exceeded that observed in 2019. Not only is this interesting, but it conflicts with CSTADS data that suggests the prevalence of trying smoking among this demographic has been decreasing over time [3], suggesting instead that more YYAs are trying cigarettes today than there were YYAs trying cigarettes in 2019. It remains unknown whether the most recent CSTADS data will reflect this finding.

The most important tobacco use finding that emerged relates to the temporal relationship between vaping and smoking for those in the sample with a history of tobacco use. While the largest proportion of respondents in 2019 reported smoking before vaping, the largest proportion of respondents in this survey reported smoking after vaping. In fact, the number of participants who reported smoking after vaping tripled between 2019 and 2024. Additionally, less than half the respondents in the 2019 survey reported knowing someone who smoked after first vaping. This number has increased to more than half in 2024. Taken together, these findings provide some degree of support for the vaping-to-smoking gateway hypothesis which has been reported in the literature for several years [18]. There is a need for additional advocacy efforts to further reinforce the idea that vaping among never-smokers can in fact lead to smoking uptake.

Related to the above point are the notable differences in the temporal relationship between vaping and smoking observed between current and former vapers in this sample. More specifically, significantly more current vapers started to smoke after vaping compared to former vapers, and significantly more former vapers started to smoke and vape concurrently compared to current vapers. At face value, this appears to show that the gateway hypothesis is becoming more relevant as time goes on as those who vape now are more likely to have started smoking

after vaping compared to those who vaped in the past. Additional analyses were carried out by separating current and former tobacco users in attempts to gain more insight into these findings. If looking at only former tobacco users, we see the same temporal relationships for our vaping status groups. However, we also find that significantly more young adults started smoking before vaping, while significantly more youth started smoking and vaping concurrently. If we examine only current tobacco users, we see no differences for vaping status or age.

Considering the totality of these findings, we can observe two apparent patterns. With respect to vaping status, it would appear that significantly more former vapers used vaping to quit smoking, and significantly more current vapers used vaping as a gateway to smoking. Regarding age, it seems that the younger you are when you start vaping, the more likely you are to start smoking either concurrently with or after the onset of vaping. It is important to note that this interpretation should be considered with some caution as the pattern of findings was not entirely clear, even after breaking them down by tobacco use status. Nonetheless, they highlight the importance of recognizing the potential for e-cigarettes to lead to tobacco use. Future advocacy work should focus on making this association clear and should continue to argue for the importance of early interventions to prevent e-cigarette uptake among youth.

One additional key finding relates to the reasons those who started smoking after vaping (and those who knew someone who did) gave for why they started smoking after vaping. One of the primary reasons given was the accessibility of cigarettes relative to vaping products. This finding is alarming and highlights the need for additional crackdowns on the accessibility of tobacco products for young people. In addition to the physical accessibility of cigarettes, it is also important to ensure that the price of entry for cigarettes is never exceeded by that of vaping products as it may encourage a switch to smoking. At present, the average cost of a package of cigarettes in Nova Scotia is approximately $17.75, while the average cost of a vaping device is approximately $20. This is a legislative gap that must be addressed. A related finding regarding the accessibility of cigarettes is that accessibility seems to be one reason former vapers in this sample started smoking after vaping. At face value, it looks like these individuals may have quit vaping in favour of smoking, perhaps due to cost or physical accessibility considerations. Taken together, cigarettes being perceived as more accessible than vaping products represents a concerning shift in the vaping landscape that must be addressed through advocacy and further legislative measures.

5.6 Nicotine Pouches – An Emerging Concern that Requires Attention

In 2019, vaping products were the most commonly used nicotine-based product by young people in Canada [1]. It was not until the 2020s that nicotine pouches began to explode in popularity, with brands such as ZYN leading the charge. To date, no comprehensive surveys have collected data on nicotine pouch usage among young people. This survey sought to address this gap.

With respect to ever having tried a nicotine pouch, almost half the YYAs in this sample said they had. When asked why they had tried one, curiosity was the predominant reason. While this

reasoning makes sense, especially since tobaccoless nicotine pouches are a relatively new product, the next two most common reasons cited are cause for concern. The second most cited reason participants gave for trying a nicotine pouch was to reduce the amount they were vaping. This is problematic as using a nicotine pouch to reduce vaping is simply substituting one harmful product with another under the guise of nicotine pouches being a safer alternative to vaping. In reality, both products are addictive and contain chemicals which likely have the potential for long-term health effects. The third most cited reason participants gave for trying a nicotine pouch was that nicotine pouches are more accessible than vaping products. This is concerning as it suggests nicotine pouches may be replacing vaping products as a gateway to nicotine addiction among YYAs. Taken together, there is a clear need to address the emerging issue of nicotine pouches through increased education on their potential harms and advocacy efforts aimed at limiting their accessibility.

A second important finding that emerged regarding nicotine pouches concerned advertisement exposure. A sizeable number of participants in this sample reported being exposed to an advertisement for nicotine pouches. Most often, these advertisements were encountered on social media and in storefronts. While the Government of Canada has introduced legislation aimed at ensuring nicotine pouch advertisements are not appealing to youth, further measures are needed to limit the overall reach of advertisements for nicotine pouches.

5.7 Impact of Legislation – Mixed Results Through Five Years

The final portion of the survey asked participants to self-report the degree to which they felt each piece of vaping legislation in Nova Scotia had impacted their vaping behaviour since being introduced. The piece of legislation which had the least impact on the vaping behaviour of YYAs was the flavour ban. Over three-quarters of respondents in this sample reported that the flavour ban had no impact on their vaping behaviour. This is further supported by the fact that flavours were still being used as frequently by participants in this survey as was observed in the 2019 survey. Additionally, anecdotal evidence provided by public health officers in Nova Scotia suggests flavours are continuing to be sold at high rates in the province [7]. Data collected on the source of flavoured vape juice illustrates that it continues to come primarily from speciality vape shops located within the province. As such, the theories that online sales from out of province and black-market flavours are replacing legitimately sourced flavours are both unsupported. There is a clear gap in enforcement with respect to the flavour ban which must be addressed going forward.

The nicotine concentration cap introduced at the federal and provincial levels appears to have had some impact on YYA vaping. While most respondents in this sample reported that it had no impact on their vaping behaviour, other collected data tells a different story. For instance, the average nicotine concentration used by participants in this sample was much lower than what was observed in 2019. While most participants in 2019 used 50-60mg/mL, the largest proportion of participants in this sample used 20-35mg/mL. Should most of these participants be using nicotine concentrations on the low end of this range, it suggests the nicotine concentration cap has been doing its job. That said, it is important to note that a sizeable number of participants in

this sample reported using nicotine concentrations up to 60mg/mL. As such, there is work still to be done with respect to enforcing this piece of legislation. Additionally, overall vaping use patterns have not changed much since 2019, suggesting capping the nicotine concentration allowed in vaping products did not impact overall vaping behaviour in the way that may have originally been hypothesized.

The ban on vaping product advertising appears to have had the most impact overall. The overall prevalence of vaping advertisement exposure has decreased significantly from what was observed in 2019. That said, advertising exposure remains fairly common, especially among youth. As such, further work is needed to limit the reach of vaping advertising. One potential gap to address is influencers on social media who advertise vaping products. Since influencers are not a traditional avenue for advertising, it is likely that the current legislation does not capture influencers effectively enough, especially if they are not using advertising materials developed by vaping brands in their social media content. Given the reach influencers have in the social media space, this should be a central avenue for advocacy going forward.

Finally, the taxation increase on vaping products appears to have had minimal impact on YYA vaping. While a much larger proportion of respondents said the taxation increase impacted their vaping behaviour when compared to the other pieces of legislation, the largest proportion of participants still indicated that it had no impact. One central finding surrounding the taxation increase is that significantly more former vapers than current vapers reported that it made them vape less. This suggests that some former vapers may have been deterred by the price increase to vaping products; however, further investigation would be needed to determine whether this is the case. If so, based on findings related to tobacco use, it may be the case that former vapers simply switched to cigarettes as they may have been a cheaper alternative. An additional consideration is that respondents in our sample were vaping as heavily, if not heavier, than respondents from the 2019 survey and were also spending significantly more than respondents in 2019. This, coupled with the very small dip in overall vaping prevalence among this demographic over the last five years, suggests taxation has not priced young people out of vaping. This is particularly notable given the number of participants who indicated that cigarettes and nicotine pouches are more accessible than vaping products, potentially due to the fact that they are sometimes cheaper than vaping products. As such, further increases to the price of vaping products is not a viable solution unless other tobacco products are also to increase to a similar price range.

6 Limitations

This survey is not without its limitations. First and foremost, the sample size collected was smaller than anticipated. Initially, it was planned to collect responses from n = 500 current vapers and n = 300 former vapers to match sample sizes collected as part of the *2019 Youth and Young Adult Vaping Survey* and the survey conducted with former vapers in 2020. However, due to technical issues with the survey platform used, as well as budgetary constraints, we were only able to collect responses from n = 279 current vapers and n = 101 former vapers. Nonetheless, this sample size was large enough to draw meaningful

conclusions. Second, there was a significant underrepresentation of males and youth in the sample, preventing additional group comparisons based on combined age and sex categories from being made (as was done with the data collected in 2019). Nonetheless, comparisons were still able to be drawn based on vaping status and age. Finally, most of the questions asked in this survey were self-report in nature, meaning all data collected must be interpreted with some caution. That said, many of the findings align with those observed in 2019, as well as in other surveys, suggesting that data is reliable.

7 Conclusion

The *2024 Youth and Young Adult Vaping Project* sought to follow-up and expand on the *2019 Youth and Young Adult Vaping Survey* and make inferences about the effectiveness of Nova Scotia's vaping legislation by examining changes in vaping trends among YYAs in Nova Scotia over a five-year period. The results indicate that very little has changed in the vaping landscape over five years, with many of the problems identified in 2019 continuing to persist. While it will remain unknown how the prevalence of vaping among YYAs in Nova Scotia has changed until the next iteration of the CSTADS is released, this survey's findings suggest most of the legislation introduced in Nova Scotia since 2020 has had little impact on the vaping behaviour of YYAs. Some of the more notable findings from this survey, such as the increase in the number of smokers who first vaped, the emergence of nicotine pouches, and changing perceptions around the accessibility of cigarettes relative to vaping products, highlight the need for comprehensive advocacy efforts aimed at closing legislative gaps and bringing awareness to novel issues. Overall, there remains much work to be done before significant changes in YYA vaping in Nova Scotia will be observed.

8 References

[1] Health Canada. Canadian Student Tobacco, Alcohol and Drugs Survey [Internet]. Ottawa, ON; 2019. Available from: https://www.canada.ca/en/health-canada/services/canadian-student-tobacco-alcohol-drugs-survey.html

[2] Al-Hamdani M, Hopkins DB, Davidson M. The 2020-2021 Youth and Young Adult Vaping Project [Internet]. Halifax, NS; 2021. Available from: https://www.heartandstroke.ca/-/media/pdf-files/get-involved/yyav-full-report-final-eng-24-3-2021.ashx

[3] Health Canada. Canadian Student Tobacco, Alcohol and Drugs Survey 2021-2022 [Internet]. Ottawa, ON; 2024. Available from: https://www.canada.ca/en/health-canada/services/canadian-student-tobacco-alcohol-drugs-survey/2021-2022-summary.html.

[4] Hopkins DB, Al-Hamdani M. Young Canadian e-Cigarette Users and the COVID-19 Pandemic: Examining Vaping Behaviors by Pandemic Onset and Gender. Front Public Health. 2021 Jan;8:620748. doi: 10.3389/fpubh.2020.620748.

[5] Harwood TG, Garry T. An Overview of Content Analysis. Mark Rev. 2003 Dec;3(4):479-98. doi: 10.1362/146934703771910080.

[6] Morean ME, Krishnan-Sarin S, Sussman S, Foulds J, Fishbein H, Grana R, O'Malley SS. Psychometric Evaluation of the E-cigarette Dependence Scale. Nicotine Tob Res. 2019 Nov;21(11):1556-64. doi: 10.1093/ntr/ntx271.

[7] Davidson M. Nova Scotia Tobacco and Vaping Industry Scan: A Five-Year Retrospective.

[8] Oyston J. A Fresh Approach to Tobacco Control: Raising the Minimum Legal Age for Access. CMAJ. 2017 Feb;189(8):E293-4. doi: 10.1503/cmaj.161489.

[9] Ahmad S, Billimek J. Limiting Youth Access to Tobacco: Comparing the Long-Term Health Impacts of Increasing Cigarette Excise Taxes and Raising the Legal Smoking Age to 21 in the United States. Health Policy. 2007 Mar;80(3):378-91. doi: 10.1016/j.healthpol.2006.04.001.

[10] Kwan LY, Stratton K, Bonnie RJ. Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products. Washington (DC): National Academies Press; 2015.

[11] Schneider SK, Buka SL, Dash K, Winickoff JP, O'Donnell L. Community Reductions in Youth Smoking After Raising the Minimum Tobacco Sales Age to 21. Tob Control. 2016 May;25(3):355-9. doi: 10.1136/tobaccocontrol-2014-052207.

[12] Reid JL, Burkhalter R, Kasza K, Seo YS, East K, Hyland A, Hammond D. Minimum Legal Age Laws and Perceived Access to Cigarettes, E-cigarettes, and Other Substances Among

Youth in Canada, England, and the United States: 2017-2021. Int J Drug Policy. 2023 May;115:104003. doi: 10.1016/j.drugpo.2023.104003.

[13] Al-Hamdani M, Davidson M, Bird D, Hopkins DB, Smith S. Learning from Their Experiences: Strategies Used by Youth and Young Adult Ex-vapers. J Subst Use Addict Treat. 2023 Jun;149:209038. doi: 10.1016/j.josat.2023.209038.

[14] Palmer AM, Carpenter MJ, Rojewski AM, Haire K, Baker NL, Toll BA. Nicotine Replacement Therapy for Vaping Cessation Among Mono and Dual Users: A Mixed Methods Preliminary Study. Addict Behav. 2023 Apr;139:107579. doi: 10.1016/j.addbeh.2022.107579.

[15] Graham AL, Cha S, Jacobs MA, Amato MS, Funsten AL, Edwards G, Papandonatos GD. A Vaping Cessation Text Message Program for Adolescent E-cigarette Users: A Randomized Clinical Trial. JAMA. 2024 Sep;332(9):713-21. doi: 10.1001/jama.2024.11057.

[16] Donovan EM, Azadi M, McKay T, Aarvig K, Kreslake J. Not-so-disposable E-cigarettes: Methods Young People Use to Discard Single-use E-cigarettes. Addiction. 2024 Jun;120(3):452-7. doi: 10.1111/add.16538.

[17] Madden M, Lenhart A, Cortesi S, Gasser U, Duggan M, Smith A, Beaton M. Teens, Social Media, and Privacy. Pew Research Center. 2013 May;21(1055):2-86.

[18] Chatterjee K, Alzghoul B, Innabi A, Meena N. Is Vaping a Gateway to Smoking: A Review of the Longitudinal Studies. Int J Adolesc Med Health. 2018 Jun;30(3):20160033. doi: 10.1515/ijamh-2016-0033.

9 Appendices

Table 1. Sample Demographics

Variable	*M* (*SD*)
Age	20.73 (2.25)
Variable	***N* (%)**
Age category	
Youth (16-18)	68 (17.9)
Young adult (19-24)	312 (82.1)
Vaping status	
Current vaper	279 (73.4)
Former vaper	101 (26.6)
Sex	
Female	266 (70.2)
Male	112 (29.6)
Prefer not to say	1 (0.2)
Gender	
Woman	248 (65.2)
Man	109 (28.7)
Transman	0 (0.0)
Transwoman	1 (0.3)
Non-binary	11 (2.9)
Genderfluid	2 (0.6)
Prefer not to say	9 (2.3)
Sexual orientation	
Asexual	4 (1.1)
Bisexual	94 (24.7)
Gay or lesbian	23 (6.1)
Pansexual	20 (5.3)
Straight	226 (59.5)
Other	7 (1.8)
Prefer not to say	6 (1.5)
Cultural background[a]	
African	8 (2.1)
East Asian	2 (0.5)
European	266 (70.0)
Hispanic or Latinx	1 (0.3)
Indigenous Canadian	46 (12.1)
Middle Eastern	9 (2.4)
South Asian	7 (1.8)
Southeast Asian	5 (1.3)
Other	28 (10.0)
Prefer not to say	25 (6.6)
Geographic area	
Medium-to-large city	111 (29.2)
Suburb near medium-to-large city	47 (12.4)
Small city	74 (19.5)
Suburb near small city	11 (2.9)
Town or village	102 (26.8)

Rural area	35 (9.2)
Currently employed	
Yes	283 (74.5)
No	97 (25.5)
Physical health	
Excellent	22 (6.1)
Very good	89 (24.8)
Good	162 (45.1)
Fair	70 (19.5)
Poor	15 (4.2)
Prefer not to say	1 (0.3)
Mental health	
Excellent	10 (2.6)
Very good	37 (9.7)
Good	96 (25.3)
Fair	140 (36.8)
Poor	95 (25.0)
Prefer not to say	2 (0.6)
Alcohol use in past month	
Yes	289 (76.5)
No	89 (23.5)
Cannabis use in past month	
Yes	241 (63.8)
No	137 (36.2)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. $N = 380$.

Table 1A. Sample Demographics by Vaping Status

Variable	Current Vapers, *M* (*SD*)	Former Vapers, *M* (*SD*)
Age	20.63 (2.28)	21.01 (2.14)
Variable	**Current Vapers, *N* (%)**	**Former Vapers, *N* (%)**
Age category		
Youth (16-18)	54 (19.4)	14 (13.9)
Young adult (19-24)	225 (80.6)	87 (86.1)
Sex		
Female	198 (71.0)	68 (68.0)
Male	80 (28.7)	32 (32.0)
Prefer not to say	1 (0.3)	0 (0.0)
Gender		
Woman	187 (67.0)	62 (61.4)
Man	77 (27.6)	32 (31.6)
Transman	1 (0.4)	0 (0.0)
Transwoman	0 (0.0)	0 (0.0)
Non-binary	6 (2.2)	4 (4.0)
Genderfluid	2 (0.6)	0 (0.0)
Prefer not to say	6 (2.2)	3 (3.0)
Sexual orientation		
Asexual	3 (1.1)	1 (1.0)
Bisexual	66 (23.7)	28 (27.7)
Gay or lesbian	17 (6.1)	6 (5.9)
Pansexual	17 (6.1)	3 (3.0)
Straight	166 (59.5)	60 (59.4)
Other	6 (2.1)	1 (1.0)
Prefer not to say	4 (1.4)	2 (2.0)
Cultural background[a]		
African	7 (2.5)	1 (1.0)
East Asian	1 (0.4)	1 (1.0)
European	190 (68.1)	76 (75.2)
Hispanic or Latinx	1 (0.4)	0 (0.0)
Indigenous Canadian	37 (13.3)	9 (8.9)
Middle Eastern	6 (2.2)	3 (3.0)
South Asian	6 (2.2)	1 (1.0)
Southeast Asian	3 (1.1)	2 (2.0)
Other	30 (10.8)	8 (7.9)
Prefer not to say	20 (7.2)	5 (5.0)
Geographic area		
Medium-to-large city	77 (27.6)	34 (33.6)
Suburb near medium-to-large city	36 (12.9)	11 (10.9)
Small city	51 (18.3)	23 (22.8)
Suburb near small city	10 (3.6)	1 (1.0)
Town or village	74 (26.5)	28 (27.7)
Rural area	31 (11.1)	4 (4.0)

Currently employed		
Yes	206 (73.8)	77 (76.2)
No	73 (26.2)	24 (23.8)
Physical health		
Excellent	15 (5.7)	7 (7.4)
Very good	62 (23.4)	27 (28.7)
Good	122 (46.0)	40 (42.6)
Fair	53 (20.0)	17 (18.1)
Poor	12 (4.5)	3 (3.2)
Prefer not to say	1 (0.4)	0 (0.0)
Mental health		
Excellent	5 (1.8)	5 (5.0)
Very good	23 (8.2)	14 (13.8)
Good	73 (26.2)	23 (22.8)
Fair	99 (35.5)	41 (40.6)
Poor	77 (27.6)	18 (17.8)
Prefer not to say	2 (0.7)	0 (0.0)
Alcohol use in past month		
Yes	208 (74.8)	81 (81.0)
No	70 (25.2)	19 (19.0)
Cannabis use in past month		
Yes	172 (61.9)	69 (69.0)
No	106 (38.1)	31 (31.0)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. *N* = 380.

Table 1B. Sample Demographics by Age

Variable	Youth, *N* (%)	Young Adults, *N* (%)
Sex		
Female	39 (57.4)	227 (73.0)
Male	29 (42.6)	83 (26.7)
Prefer not to say	0 (0.0)	1 (0.3)
Gender		
Woman	36 (52.9)	213 (68.3)
Man	29 (42.6)	80 (25.6)
Transman	0 (0.0)	1 (0.3)
Transwoman	0 (0.0)	0 (0.0)
Non-binary	2 (2.9)	8 (2.6)
Genderfluid	0 (0.0)	2 (0.6)
Prefer not to say	1 (1.6)	8 (2.6)
Sexual orientation		
Asexual	0 (0.0)	4 (1.2)
Bisexual	16 (23.5)	78 (25.0)
Gay or lesbian	5 (7.4)	18 (5.8)
Pansexual	2 (2.9)	18 (5.8)
Straight	40 (58.8)	186 (59.6)
Other	2 (2.9)	5 (1.6)
Prefer not to say	3 (4.5)	3 (1.0)
Cultural background[a]		
African	6 (8.8)	2 (0.6)
East Asian	0 (0.0)	2 (0.6)
European	42 (61.8)	224 (71.8)
Hispanic or Latinx	0 (0.0)	1 (0.3)
Indigenous Canadian	17 (25.0)	29 (9.3)
Middle Eastern	3 (4.4)	6 (1.9)
South Asian	3 (4.4)	4 (1.3)
Southeast Asian	0 (0.0)	5 (1.6)
Other	9 (13.2)	29 (9.3)
Prefer not to say	2 (2.9)	23 (7.4)
Geographic area		
Medium-to-large city	19 (28.0)	92 (29.4)
Suburb near medium-to-large city	10 (14.7)	37 (11.9)
Small city	11 (16.2)	63 (20.2)
Suburb near small city	2 (2.9)	9 (2.9)
Town or village	20 (29.4)	82 (26.3)
Rural area	6 (8.8)	29 (9.3)
Currently employed		
Yes	34 (50.0)	249 (79.8)
No	34 (50.0)	63 (20.2)
Physical health		
Excellent	6 (9.4)	16 (5.5)
Very good	13 (20.3)	76 (25.8)
Good	25 (39.1)	137 (46.4)
Fair	15 (23.4)	55 (18.6)

Poor	5 (7.8)	10 (3.4)
Prefer not to say	0 (0.0)	1 (0.3)
Mental health		
Excellent	3 (4.4)	7 (2.2)
Very good	9 (13.2)	28 (9.0)
Good	14 (20.6)	82 (26.3)
Fair	23 (33.8)	117 (37.5)
Poor	18 (26.5)	77 (24.7)
Prefer not to say	1 (1.5)	1 (0.3)
Alcohol use in past month		
Yes	51 (76.1)	238 (76.5)
No	16 (23.9)	73 (23.5)
Cannabis use in past month		
Yes	45 (67.2)	196 (63.0)
No	22 (32.8)	115 (37.0)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. *N* = 380.

Table 2. Participants Per Postal Code

Postal Code	*N*
Eastern Health Zone	
B0C	2
B0E	9
B0H	1
B1A	8
B1E	1
B1G	1
B1H	4
B1K	2
B1L	2
B1P	5
B1R	2
B1S	2
B1V	2
B1W	1
B1Y	3
B2A	1
B2G	9
B9A	3
Northern Health Zone	
B0K	15
B0M	5
B2S	2
B4H	11
B6L	4
Central Health Zone	
B0N	11
B2R	1
B2T	10
B2V	8
B2W	9
B2X	5
B2Y	4
B3A	7
B3B	3
B3E	4
B3G	4
B3H	25
B3J	7
B3K	15
B3L	5
B3M	11
B3N	6
B3P	4
B3R	3
B3S	4
B3T	4

B3V	1
B3Z	9
B4A	7
B4B	6
B4C	5
B4E	10
B4G	3
Western Health Zone	
B0J	7
B0P	17
B0S	7
B0T	6
B0V	1
B0W	2
B2H	10
B2N	9
B4N	11
B4P	5
B4R	3
B4V	10
B5A	6

Note. The health zones are defined according to the Nova Scotia Health Authority. *N* = 380.

Table 3. Vaping Behaviour

Variable	*M* (*SD*)
Age at first use	15.42 (2.17)
Days vaped per week	6.70 (0.95)
Vaping episodes per day	55.74 (65.35)
Puffs per vaping episode	4.86 (6.63)
Number of quit attempts	3.44 (3.27)
Spending per week on vaping	28.31 (36.27)
Variable	***N* (%)**
Parental knowledge of vaping behaviour[a]	
Yes	16 (50.0)
No	16 (50.0)
Strongest influence to start vaping	
Family	11 (2.9)
Friends	222 (58.4)
Advertisements for vaping products	3 (0.8)
Social media vaping content	19 (5.0)
Wanting to quit smoking	42 (11.1)
Other	51 (13.4)
Unsure	32 (8.4)
Method of accessing vaping products	
Purchase(d) myself	306 (80.5)
Purchase(d) by someone else	59 (15.5)
Use(d) someone else's products	15 (4.0)
Source of money for vaping products	
From a job	313 (85.8)
From an allowance	26 (7.1)
Other	26 (7.1)
Source where you purchase(d) devices[b]	
Specialty vape shop in NS	144 (47.0)
Specialty vape shop outside NS	17 (5.6)
Online specialty vape shop in NS	16 (5.2)
Online specialty vape shop outside NS	36 (11.8)
Other retail location in NS	53 (17.3)
Other retail location outside NS	4 (1.3)
From someone else	18 (5.9)
Other	18 (5.9)
Source where you purchase(d) e-juice[b]	
Specialty vape shop in NS	114 (37.6)
Specialty vape shop outside NS	14 (4.6)
Online specialty vape shop in NS	20 (6.6)
Online specialty vape shop outside NS	44 (14.5)
Other retail location in NS	29 (9.5)
Other retail location outside NS	8 (2.6)
From someone else	25 (8.2)
Other	50 (16.4)
Person who buys/bought your products[c]	
Parent/legal guardian	1 (3.4)
Sibling	4 (6.8)

Friend who is of legal age	41 (69.5)
Friend who is not of legal age	9 (15.3)
Other	3 (5.0)
Source where other person buys/bought your devices[c]	
Specialty vape shop in NS	24 (40.6)
Specialty vape shop outside NS	3 (5.1)
Online specialty vape shop in NS	3 (5.1)
Online specialty vape shop outside NS	10 (16.9)
Other retail location in NS	9 (15.3)
Other retail location outside NS	0 (0.0)
From someone else	7 (11.9)
Other	3 (5.1)
Source where other person buys/bought your e-juice[c]	
Specialty vape shop in NS	19 (32.1)
Specialty vape shop outside NS	2 (3.4)
Online specialty vape shop in NS	2 (3.4)
Online specialty vape shop outside NS	9 (15.3)
Other retail location in NS	6 (10.2)
Other retail location outside NS	2 (3.4)
From someone else	14 (23.7)
Other	5 (8.5)

[a]Question only asked to youth participants. [b]Question only asked to those who purchased their own products. [c]Question only asked to those who had others purchase their products for them. *N* = 380.

Table 3A. Current Vaper-Specific Questions

Variable	*M* (*SD*)
E-cigarette Dependence Scale	1.36 (0.84)
Variable	***N* (%)**
Do you find it hard to vape where not permitted	
Yes	128 (45.9)
No	151 (54.1)
Have you ever felt pressured to vape	
Yes	95 (34.1)
No	184 (65.9)
Have you ever offered to share your vape device with others	
Yes	263 (94.3)
No	16 (5.7)
Has someone ever offered to share their vape device with you	
Yes	272 (97.5)
No	7 (2.5)
Have you ever tried to quit vaping	
Yes	188 (67.4)
No	91 (32.6)
Do you buy your vaping products close to your school[a]	
Yes	5 (20.8)
No	19 (79.2)
How close to your school do you buy your vaping products[a,b]	
Within walking distance	3 (60.0)
Within bussing distance	2 (40.0)

Note. [a]Question was only asked to youth participants. [b]Question only asked to those who reported buying their vaping products close to their school. *N* = 279.

Table 3B. Former Vaper-Specific Questions

Variable	*M* (*SD*)
Number of quit attempts	3.63 (3.62)
Variable	***N* (%)**
Maintenance period length	
Less than a week	4 (4.0)
Less than a month	19 (18.8)
Less than a year	42 (41.6)
One year or longer	36 (35.6)
Quit method used	
Quit cold turkey	45 (45.0)
Self-restriction	10 (10.0)
Eliminating social influences	4 (4.0)
Replacing the behaviour	18 (18.0)
Thinking about health improvements	6 (6.0)
Other	17 (17.0)
Reason for quitting	
Negative side effects	23 (22.8)
Addiction	15 (14.9)
Possible long-term health effects	36 (35.5)
Cost	13 (12.9)
Stigma	2 (2.0)
Other	8 (7.9)
Unsure	4 (4.0)
Who was helpful when you were trying to quit[a]	
Parent/guardian	10 (9.9)
Other family member	5 (5.0)
Friends	34 (33.7)
Other adult in your life	1 (1.0)
Health care provider	3 (3.0)
Other	19 (18.8)
No one	39 (38.6)
What things make you want to vape again[a]	
Negative social influences	39 (38.6)
Stress/anxiety	59 (58.4)
Using other substances	44 (43.6)
Sensory experiences	61 (60.4)
Other	5 (5.0)
Nothing	12 (11.9)
What support services would help others quit vaping[a]	
Online counselling	33 (32.7)
Online support groups	31 (30.7)
In-person counselling	23 (22.8)
In-person support groups	22 (21.8)
Text-message support	45 (44.6)
Nicotine replacement therapy	69 (68.3)
Other	7 (6.9)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. *N* = 101.

Table 3C. Vaping Behaviour by Vaping Status

Variable	Current Vapers, *M* (*SD*)	Former Vapers, *M* (*SD*)
Age at first use	15.26 (2.24)	15.86 (1.89)
Days vaped per week	6.75 (0.90)	6.56 (1.09)
Vaping episodes per day	58.45 (67.66)	48.44 (58.40)
Puffs per vaping episode	5.13 (7.57)	4.12 (2.50)
Number of quit attempts	3.33 (3.06)	3.63 (3.62)
Spending per week on vaping	25.92 (20.38)	35.12 (62.05)
Variable	**Current Vapers, *N* (%)**	**Former Vapers, *N* (%)**
Parental knowledge of vaping behaviour[a]		
Yes	15 (57.7)	1 (16.7)
No	11 (42.3)	5 (83.3)
Strongest influence to start vaping		
Family	11 (3.9)	0 (0.0)
Friends	149 (53.4)	73 (72.2)
Advertisements for vaping products	3 (1.1)	0 (0.0)
Social media vaping content	14 (5.0)	5 (5.0)
Wanting to quit smoking	35 (12.6)	7 (6.9)
Other	38 (13.6)	13 (12.9)
Unsure	29 (10.4)	3 (3.0)
Method of accessing vaping products		
Purchase(d) myself	237 (84.9)	69 (68.3)
Purchase(d) by someone else	34 (12.2)	25 (24.8)
Use(d) someone else's products	8 (2.9)	7 (6.9)
Source of money for vaping products		
From a job	230 (84.9)	83 (88.3)
From an allowance	20 (7.4)	6 (6.4)
Other	21 (7.7)	5 (5.3)
Source where you purchase(d) devices[b]		
Specialty vape shop in NS	113 (47.7)	31 (44.9)
Specialty vape shop outside NS	11 (4.6)	6 (8.7)
Online specialty vape shop in NS	11 (4.6)	5 (7.3)
Online specialty vape shop outside NS	33 (13.9)	3 (4.3)
Other retail location in NS	43 (18.1)	10 (14.5)
Other retail location outside NS	2 (0.9)	2 (2.9)
From someone else	12 (5.1)	6 (8.7)
Other	12 (5.1)	6 (8.7)
Source where you purchase(d) e-juice[b]		
Specialty vape shop in NS	88 (37.3)	26 (38.1)
Specialty vape shop outside NS	9 (3.8)	5 (7.4)
Online specialty vape shop in NS	15 (6.4)	5 (7.4)
Online specialty vape shop outside NS	36 (15.3)	8 (11.8)
Other retail location in NS	24 (10.2)	5 (7.4)
Other retail location outside NS	7 (3.0)	1 (1.5)
From someone else	19 (8.0)	6 (8.8)

Other	38 (16.0)	12 (17.6)
Person who buys/bought your products[c]		
Parent/legal guardian	2 (5.9)	0 (0.0)
Sibling	2 (5.9)	2 (8.0)
Friend who is of legal age	25 (73.5)	16 (64.0)
Friend who is not of legal age	3 (8.8)	6 (24.0)
Other	2 (5.9)	1 (4.0)
Source where other person buys/bought your devices[c]		
Specialty vape shop in NS	9 (26.5)	15 (60.0)
Specialty vape shop outside NS	2 (5.8)	1 (4.0)
Online specialty vape shop in NS	3 (8.8)	0 (0.0)
Online specialty vape shop outside NS	9 (26.5)	1 (4.0)
Other retail location in NS	4 (11.8)	5 (20.0)
Other retail location outside NS	0 (0.0)	0 (0.0)
From someone else	4 (11.8)	3 (12.0)
Other	3 (8.8)	0 (0.0)
Source where other person buys/bought your e-juice[c]		
Specialty vape shop in NS	9 (26.5)	10 (40.0)
Specialty vape shop outside NS	2 (5.9)	0 (0.0)
Online specialty vape shop in NS	2 (5.9)	0 (0.0)
Online specialty vape shop outside NS	6 (17.6)	3 (12.0)
Other retail location in NS	3 (8.8)	3 (12.0)
Other retail location outside NS	1 (2.9)	1 (4.0)
From someone else	7 (20.6)	7 (28.0)
Other	4 (11.8)	1 (4.0)

[a]Question only asked to youth participants. [b]Question only asked to those who purchased their own products. [c]Question only asked to those who had others purchase their products for them. *N* = 380.

Table 3D. Vaping Behaviour by Age

Variable	Youth, *M* (*SD*)	Young Adults, *M* (*SD*)
Age at first use	13.32 (1.64)	15.88 (1.99)
Days vaped per week	6.59 (1.03)	6.72 (0.94)
Vaping episodes per day	61.28 (73.37)	54.56 (63.59)
Puffs per vaping episode	5.60 (5.82)	4.68 (6.80)
Number of quit attempts	3.14 (2.38)	3.50 (3.43)
Spending per week on vaping	32.36 (75.32)	27.32 (19.72)
Variable	**Youth, *N* (%)**	**Young Adults, *N* (%)**
Strongest influence to start vaping		
Family	1 (1.5)	10 (3.2)
Friends	39 (57.4)	182 (58.7)
Advertisements for vaping products	0 (0.0)	3 (1.0)
Social media vaping content	6 (8.8)	13 (4.2)
Wanting to quit smoking	2 (2.9)	40 (12.9)
Other	12 (17.6)	38 (12.3)
Unsure	8 (11.8)	24 (7.7)
Method of accessing vaping products		
Purchase(d) myself	29 (42.6)	276 (89.0)
Purchase(d) by someone else	36 (53.0)	22 (7.1)
Use(d) someone else's products	3 (4.4)	12 (3.9)
Source of money for vaping products		
From a job	43 (66.1)	270 (90.6)
From an allowance	12 (18.5)	12 (4.0)
Other	10 (15.4)	16 (5.4)
Source where you purchase(d) devices[a]		
Specialty vape shop in NS	7 (24.1)	136 (49.2)
Specialty vape shop outside NS	1 (3.4)	16 (5.8)
Online specialty vape shop in NS	2 (6.9)	14 (5.1)
Online specialty vape shop outside NS	6 (20.8)	30 (10.9)
Other retail location in NS	3 (10.4)	50 (18.1)
Other retail location outside NS	1 (3.4)	3 (1.1)
From someone else	7 (24.1)	11 (4.0)
Other	2 (6.9)	16 (5.8)
Source where you purchase(d) e-juice[a]		
Specialty vape shop in NS	6 (20.7)	107 (39.0)
Specialty vape shop outside NS	1 (3.4)	13 (4.7)
Online specialty vape shop in NS	2 (6.9)	20 (7.3)
Online specialty vape shop outside NS	0 (0.0)	42 (15.3)
Other retail location in NS	2 (6.9)	27 (9.9)
Other retail location outside NS	1 (3.4)	7 (2.6)
From someone else	10 (34.5)	15 (5.5)
Other	7 (24.2)	43 (15.7)
Person who buys/bought your products[b]		
Parent/legal guardian	1 (2.8)	0 (0.0)
Sibling	2 (5.5)	2 (9.2)
Friend who is of legal age	27 (75.0)	14 (63.6)

Friend who is not of legal age	6 (16.7)	3 (13.6)
Other	0 (0.0)	3 (13.6)
Source where other person buys/bought your devices[b]		
Specialty vape shop in NS	11 (30.6)	13 (59.1)
Specialty vape shop outside NS	3 (8.3)	0 (0.0)
Online specialty vape shop in NS	3 (8.3)	0 (0.0)
Online specialty vape shop outside NS	5 (13.9)	4 (18.2)
Other retail location in NS	6 (16.7)	3 (13.6)
Other retail location outside NS	0 (0.0)	0 (0.0)
From someone else	5 (13.9)	2 (9.1)
Other	3 (8.3)	0 (0.0)
Source where other person buys/bought your e-juice[b]		
Specialty vape shop in NS	9 (25.0)	10 (45.5)
Specialty vape shop outside NS	2 (5.6)	0 (0.0)
Online specialty vape shop in NS	2 (5.6)	0 (0.0)
Online specialty vape shop outside NS	5 (13.8)	4 (18.2)
Other retail location in NS	3 (8.3)	3 (13.6)
Other retail location outside NS	2 (5.6)	0 (0.0)
From someone else	10 (27.8)	4 (18.2)
Other	3 (8.3)	1 (4.5)

Note. [a]Question only asked to those who purchased their own products. [b]Question only asked to those who had others purchase their products for them. *N* = 380.

Table 4. Product Preferences

Variable	*M* (*SD*)
Pods per week[a]	2.64 (2.57)
Disposables per week[b]	0.97 (0.66)
Variable	***N* (%)**
First device used	
Pod-based device	178 (47.0)
Disposable vape	102 (26.9)
Modifiable device	86 (22.7)
Vape pen	9 (2.4)
Traditional e-cigarette	4 (1.0)
Most recent device used	
Pod-based device	139 (36.7)
Disposable vape	214 (56.5)
Modifiable device	13 (3.4)
Vape pen	11 (2.9)
Traditional e-cigarette	2 (0.5)
Content of vaping products at uptake	
Vape juice with nicotine	329 (86.6)
Vape juice without nicotine	25 (6.6)
Dry cannabis	3 (0.8)
Liquid cannabis concentrate	19 (5.0)
Other	2 (0.5)
Unsure	2 (0.5)
Most recent content of vaping products	
Vape juice with nicotine	346 (91.3)
Vape juice without nicotine	7 (1.8)
Dry cannabis	3 (0.8)
Liquid cannabis concentrate	14 (3.7)
Other	8 (2.1)
Unsure	1 (0.3)
Nicotine concentration at uptake[c]	
1-19 mg/mL	63 (19.2)
20-35 mg/mL	113 (34.3)
36-50 mg/mL	57 (17.3)
50+ mg/mL	79 (24.0)
Unsure	17 (5.2)
Most recent nicotine concentration[d]	
1-19 mg/mL	35 (10.2)
20-35 mg/mL	187 (54.0)
36-50 mg/mL	55 (15.9)
50+ mg/mL	62 (17.9)
Unsure	7 (2.0)
Use of flavours at uptake	
Yes	363 (95.5)
No	17 (4.5)
Use of flavours at present/at cessation	
Yes	340 (89.5)
No	40 (10.5)

Source of flavoured vape juice[e]	
Specialty vape shop in NS	124 (36.6)
Specialty vape shop outside NS	20 (5.9)
Online specialty vape shop in NS	22 (6.5)
Online specialty vape shop outside NS	52 (15.3)
Other retail location in NS	54 (15.9)
Other retail location outside NS	4 (1.2)
From someone else	45 (13.3)
Other	18 (5.3)

[a]Question asked only to those who reported most recently using pod-based devices. [b]Question asked only to those who reported most recently using disposable devices. [c]Question asked only to those who reported using nicotine at uptake. [d]Question asked only to those who reported most recently using nicotine. [e]Question asked only to those who reported most recently using flavoured vape juice. *N* = 380.

Table 4A. Popular Vaping Device Brands

Device brands (number of participants who used the brand)					
STLTH (114)	UWell/Caliburn (48)	ELFBAR (38)	SMOK (26)	Vuse (15)	WAKA (11)
Flavour Beast (10)	GeekVape (10)	Quizz (10)	Draggg (5)	Allo (4)	Pop Pods (4)
RUFPUF (4)	Vaporesso (4)	Puff Bar (3)	Gcore (2)	IVG (2)	Juul (2)
Lost Mary (2)	MRVI (2)	Packs Pod (2)	510 (1)	AirVape (1)	Aloha Sun (1)
Aspire (1)	Bloom (1)	Breeze (1)	ENVI (1)	FEED (1)	FreeMax (1)
HQD (1)	Hustler (1)	ICEWAVE (1)	Icon Bar (1)	OXBAR (1)	OXVA (1)
RabBeats (1)	RELX (1)	SLiM (1)	TUGBOAT (1)	Vabeen (1)	VEEV (1)
VFEEL (1)	VICE (1)	Voopoo (1)	VOZOL (1)	Yocan Kodo (1)	Various (22)

Note. *N* = 380.

Table 4B. Product Preferences by Vaping Status

Variable	Current Vapers, *M* (*SD*)	Former Vapers, *M* (*SD*)
Pods per week[a]	2.55 (2.54)	2.85 (2.67)
Disposables per week[b]	0.91 (0.48)	1.15 (1.01)
Variable	**Current Vapers, *N* (%)**	**Former Vapers, *N* (%)**
First device used		
Pod-based device	127 (45.7)	51 (50.5)
Disposable vape	73 (26.3)	29 (28.7)
Modifiable device	67 (24.1)	19 (18.8)
Vape pen	8 (2.9)	1 (1.0)
Traditional e-cigarette	3 (1.0)	1 (1.0)
Most recent device used		
Pod-based device	99 (35.6)	40 (39.5)
Disposable vape	159 (57.2)	55 (54.5)
Modifiable device	10 (3.6)	3 (3.0)
Vape pen	8 (2.9)	3 (3.0)
Traditional e-cigarette	2 (0.7)	0 (0.0)
Content of vaping products at uptake		
Vape juice with nicotine	238 (85.3)	91 (90.0)
Vape juice without nicotine	22 (7.9)	3 (3.0)
Dry cannabis	3 (1.1)	0 (0.0)
Liquid cannabis concentrate	14 (5.0)	5 (5.0)
Other	2 (0.7)	0 (0.0)
Unsure	0 (0.0)	2 (2.0)
Most recent content of vaping products		
Vape juice with nicotine	255 (91.4)	91 (90.0)
Vape juice without nicotine	5 (1.8)	2 (2.0)
Dry cannabis	2 (0.7)	1 (1.0)
Liquid cannabis concentrate	11 (3.9)	3 (3.0)
Other	6 (2.2)	2 (2.0)
Unsure	0 (0.0)	1 (1.0)
Nicotine concentration at uptake[c]		
1-19 mg/mL	49 (20.6)	14 (15.3)
20-35 mg/mL	83 (34.9)	30 (33.0)
36-50 mg/mL	38 (16.0)	19 (20.9)
50+ mg/mL	58 (24.4)	21 (23.1)
Unsure	10 (4.1)	7 (7.7)
Most recent nicotine concentration[d]		
1-19 mg/mL	28 (11.0)	7 (7.7)
20-35 mg/mL	146 (57.2)	41 (45.0)
36-50 mg/mL	39 (5.3)	16 (17.6)
50+ mg/mL	38 (14.9)	24 (26.4)
Unsure	4 (1.6)	3 (3.3)
Use of flavours at uptake		
Yes	267 (95.7)	96 (95.0)

No	12 (4.3)	5 (5.0)
Use of flavours at present/at cessation		
Yes	247 (88.5)	93 (92.1)
No	32 (11.5)	8 (7.9)
Source of flavoured vape juice[e]		
Specialty vape shop in NS	85 (34.5)	39 (41.9)
Specialty vape shop outside NS	14 (5.7)	6 (6.5)
Online specialty vape shop in NS	17 (6.9)	5 (5.4)
Online specialty vape shop outside NS	43 (17.5)	9 (9.7)
Other retail location in NS	42 (17.1)	12 (12.9)
Other retail location outside NS	3 (1.2)	1 (1.1)
From someone else	31 (12.6)	14 (15.1)
Other	11 (4.5)	7 (7.4)

[a]Question asked only to those who reported most recently using pod-based devices. [b]Question asked only to those who reported most recently using disposable devices. [c]Question asked only to those who reported using nicotine at uptake. [d]Question asked only to those who reported most recently using nicotine. [e]Question asked only to those who reported most recently using flavoured vape juice. *N* = 380.

Table 4C. Product Preferences by Age

Variable	Youth, *M* (*SD*)	Young Adults, *M* (*SD*)
Pods per week[a]	2.60 (2.71)	2.62 (2.54)
Disposables per week[b]	0.88 (0.41)	0.99 (0.70)
Variable	**Youth, *N* (%)**	**Young Adults, *N* (%)**
First device used		
Pod-based device	38 (55.9)	140 (45.3)
Disposable vape	26 (38.2)	74 (23.9)
Modifiable device	2 (2.9)	84 (27.2)
Vape pen	1 (1.5)	8 (2.6)
Traditional e-cigarette	1 (1.5)	3 (1.0)
Most recent device used		
Pod-based device	30 (44.1)	108 (35.0)
Disposable vape	34 (50.0)	180 (58.2)
Modifiable device	1 (1.5)	12 (3.9)
Vape pen	2 (2.9)	8 (2.6)
Traditional e-cigarette	1 (1.5)	1 (0.3)
Content of vaping products at uptake		
Vape juice with nicotine	58 (85.3)	270 (87.2)
Vape juice without nicotine	3 (4.4)	22 (7.1)
Dry cannabis	1 (1.5)	2 (0.6)
Liquid cannabis concentrate	6 (8.8)	12 (3.9)
Other	0 (0.0)	2 (0.6)
Unsure	0 (0.0)	2 (0.6)
Most recent content of vaping products		
Vape juice with nicotine	61 (89.7)	284 (92.0)
Vape juice without nicotine	1 (1.5)	6 (1.9)
Dry cannabis	1 (1.5)	1 (0.3)
Liquid cannabis concentrate	5 (7.4)	9 (2.9)
Other	0 (0.0)	8 (2.6)
Unsure	0 (0.0)	1 (0.3)
Nicotine concentration at uptake[c]		
1-19 mg/mL	4 (6.9)	59 (21.9)
20-35 mg/mL	19 (32.8)	94 (34.8)
36-50 mg/mL	14 (24.1)	43 (15.9)
50+ mg/mL	16 (27.6)	62 (23.0)
Unsure	5 (8.6)	12 (4.4)
Most recent nicotine concentration[d]		
1-19 mg/mL	4 (6.6)	31 (10.9)
20-35 mg/mL	28 (45.8)	159 (56.0)
36-50 mg/mL	14 (23.0)	41 (14.5)
50+ mg/mL	14 (23.0)	47 (16.5)
Unsure	1 (1.6)	6 (2.1)
Use of flavours at uptake		
Yes	62 (91.2)	300 (96.8)
No	6 (8.8)	10 (3.2)
Use of flavours at present/at cessation		

Yes	63 (92.6)	276 (89.0)
No	5 (7.4)	34 (11.0)
Source of flavoured vape juice[e]		
Specialty vape shop in NS	15 (23.8)	108 (39.2)
Specialty vape shop outside NS	3 (4.8)	17 (6.2)
Online specialty vape shop in NS	4 (6.3)	18 (6.5)
Online specialty vape shop outside NS	7 (11.1)	45 (16.4)
Other retail location in NS	9 (14.3)	45 (16.4)
Other retail location outside NS	1 (1.6)	3 (1.1)
From someone else	22 (34.9)	23 (8.4)
Other	2 (3.2)	16 (5.8)

[a]Question asked only to those who reported most recently using pod-based devices. [b]Question asked only to those who reported most recently using disposable devices. [c]Question asked only to those who reported using nicotine at uptake. [d]Question asked only to those who reported most recently using nicotine. [e]Question asked only to those who reported most recently using flavoured vape juice. *N* = 380.

Table 5. Expectancies

Variable	*N* (%)
Best aspects of vaping	
Flavours	36 (9.4)
Nicotine rush	105 (27.9)
Tricks	7 (1.9)
Smoking alternative	19 (5.0)
Smoking cessation aid	7 (1.9)
Cost	3 (0.8)
Social aspects	18 (4.8)
Discreetness	20 (5.3)
Mood enhancement	147 (39.0)
Other	11 (2.9)
Unsure	4 (1.1)
Worst aspects of vaping	
Negative side-effects	76 (20.0)
Addiction	71 (18.7)
Long-term health effects	125 (32.9)
Product malfunction	31 (8.2)
Cost	51 (13.4)
Stigma	11 (2.9)
Other	10 (2.6)
Unsure	5 (1.3)
Experienced side-effects	
Yes	204 (53.7)
No	94 (24.7)
Unsure	82 (21.6)
Side-effect experienced[a,b]	
Respiratory	142 (69.6)
Nicotine-related	148 (72.5)
Other	101 (49.5)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to those who reported experiencing side effects. *N* = 380.

Table 5A. Expectancies by Vaping Status

Variable	Current Vapers, *N* (%)	Former Vapers, *N* (%)
Best aspects of vaping		
Flavours	26 (9.4)	10 (9.9)
Nicotine rush	68 (24.6)	37 (36.6)
Tricks	5 (1.8)	2 (2.0)
Smoking alternative	18 (6.5)	1 (1.0)
Smoking cessation aid	6 (2.2)	1 (1.0)
Cost	2 (0.7)	1 (1.0)
Social aspects	10 (3.6)	8 (7.9)
Discreetness	19 (6.9)	1 (1.0)
Mood enhancement	109 (39.5)	38 (37.6)
Other	10 (3.6)	1 (1.0)
Unsure	3 (1.2)	1 (1.0)
Worst aspects of vaping		
Negative side-effects	50 (17.9)	26 (25.7)
Addiction	52 (18.6)	19 (18.8)
Long-term health effects	101 (36.2)	24 (23.8)
Product malfunction	23 (8.3)	8 (7.9)
Cost	35 (12.5)	16 (15.8)
Stigma	7 (2.5)	4 (4.0)
Other	7 (2.5)	3 (3.0)
Unsure	4 (1.5)	1 (1.0)
Experienced side-effects		
Yes	141 (50.5)	63 (62.4)
No	74 (26.5)	20 (19.8)
Unsure	64 (23.0)	18 (17.8)
Side-effect experienced[a,b]		
Respiratory	101 (71.6)	41 (65.1)
Nicotine-related	103 (73.0)	45 (71.4)
Other	66 (46.8)	35 (55.6)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to those who reported experiencing side effects. *N* = 380.

Table 5B. Expectancies by Age

Variable	Youth, *N* (%)	Young Adults, *N* (%)
Best aspects of vaping		
Flavours	6 (9.0)	30 (9.7)
Nicotine rush	24 (35.8)	80 (26.0)
Tricks	3 (4.5)	4 (1.4)
Smoking alternative	3 (4.5)	16 (5.2)
Smoking cessation aid	1 (1.4)	6 (1.9)
Cost	0 (0.0)	3 (1.0)
Social aspects	4 (6.0)	14 (4.5)
Discreetness	3 (4.5)	17 (5.5)
Mood enhancement	20 (29.9)	126 (40.9)
Other	2 (3.0)	9 (2.9)
Unsure	1 (1.4)	3 (1.0)
Worst aspects of vaping		
Negative side-effects	20 (29.4)	56 (18.1)
Addiction	9 (13.2)	62 (20.0)
Long-term health effects	16 (23.5)	109 (35.2)
Product malfunction	6 (8.8)	24 (7.7)
Cost	13 (19.2)	38 (12.3)
Stigma	2 (2.9)	9 (2.9)
Other	1 (1.5)	8 (2.6)
Unsure	1 (1.5)	4 (1.2)
Experienced side-effects		
Yes	39 (57.4)	165 (53.2)
No	14 (20.6)	80 (25.8)
Unsure	15 (22.0)	65 (210)
Side-effect experienced[a,b]		
Respiratory	31 (79.5)	111 (67.3)
Nicotine-related	30 (76.9)	118 (71.5)
Other	24 (61.5)	77 (46.7)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to those who reported experiencing side effects. *N* = 380.

Table 6. Advertising and Social Media

Variable	*N* (%)
Exposure to vaping ads	
Yes	156 (41.1)
No	224 (58.9)
Platform of vaping ad exposure[a,b]	
Facebook	59 (37.8)
Instagram	85 (54.5)
Snapchat	55 (35.3)
TikTok	71 (45.5)
Reddit	5 (3.2)
Twitter/X	20 (12.8)
YouTube	35 (22.4)
Other social media platform	0 (0.0)
Non-social media website	30 (19.2)
Radio	11 (7.1)
Television	19 (12.2)
Billboards	19 (12.2)
Print media	22 (14.1)
Other	4 (2.6)
Source of advertisements[a,b]	
Vaping brands	108 (69.2)
Vaping retailers	71 (45.5)
Influencers	63 (40.4)
Non-influencer selling products	41 (26.3)
Other	2 (1.3)
Unsure	14 (9.0)
Exposure to vaping content on social media	
Yes	221 (58.2)
No	159 (41.8)
Platform of vaping content exposure[a,c]	
Facebook	64 (29.0)
Instagram	148 (67.0)
Snapchat	140 (63.3)
TikTok	185 (83.7)
Reddit	29 (13.1)
Twitter/X	24 (10.9)
YouTube	85 (38.5)
Other	0 (0.0)
Source of social media content[a,c]	
Vaping brands	60 (27.1)
Vaping retailers	43 (19.5)
Pro-vaping organizations	13 (5.9)
Health promotion organizations	67 (30.3)
The government	47 (21.3)
Influencers	150 (67.9)
Friends	124 (56.1)
Family members	24 (10.9)
Strangers	106 (48.0)

Other	13 (5.9)
Unsure	0 (0.0)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to participants who reported vaping ad exposure. [c]Question only asked to participants who reported exposure to vaping on social media. *N* = 380.

Table 6A. Content of Advertisements and Social Media Posts

Variable	*N* (%)
Ad content	
Brands advertising devices	49 (47.6)
Brands advertising flavours	8 (7.8)
Friends selling products	2 (1.9)
Health promotion	11 (10.7)
Influencers promoting products	11 (10.7)
Retailers promoting products	7 (6.8)
Other	15 (14.5)
Social media content	
Health promotion	27 (17.2)
Memes	7 (4.5)
People using vaping products	49 (31.2)
People promoting vaping	17 (10.8)
Tricks	53 (33.8)
Meaningless	4 (2.5)

Note. Meaningless refers to any response that contained only information that was irrelevant to the question being asked. *N* = 157.

Table 6B. Advertising and Social Media by Vaping Status

Variable	Current Vapers, *N* (%)	Former Vapers, *N* (%)
Exposure to vaping ads		
Yes	118 (42.3)	38 (37.6)
No	161 (57.7)	63 (62.4)
Platform of vaping ad exposure[a,b]		
Facebook	48 (40.7)	11 (28.9)
Instagram	63 (53.4)	22 (57.9)
Snapchat	38 (32.2)	17 (44.7)
TikTok	53 (44.9)	18 (47.4)
Reddit	5 (4.2)	0 (0.0)
Twitter/X	17 (14.4)	3 (7.9)
YouTube	25 (21.2)	10 (26.3)
Other social media platform	0 (0.0)	0 (0.0)
Non-social media website	27 (22.9)	3 (7.9)
Radio	6 (5.1)	5 (13.2)
Television	17 (14.4)	2 (5.3)
Billboards	17 (14.4)	2 (5.3)
Print media	15 (12.7)	7 (18.4)
Other	4 (3.4)	0 (0.0)
Source of advertisements[a,b]		
Vaping brands	84 (71.2)	24 (63.2)
Vaping retailers	56 (47.5)	15 (39.5)
Influencers	48 (40.7)	15 (39.5)
Non-influencer selling products	31 (26.3)	10 (26.3)
Other	1 (0.8)	1 (2.6)
Unsure	9 (7.6)	5 (13.2)
Exposure to vaping content on social media		
Yes	164 (58.8)	57 (56.4)
No	115 (41.2)	4 (43.6)
Platform of vaping content exposure[a,c]		
Facebook	45 (27.4)	19 (33.3)
Instagram	105 (64.0)	43 (75.4)
Snapchat	103 (62.8)	37 (64.9)
TikTok	139 (84.8)	46 (80.7)
Reddit	24 (14.6)	5 (8.8)
Twitter/X	17 (10.4)	7 (12.3)
YouTube	61 (37.2)	24 (42.1)
Other	0 (0.0)	0 (0.0)
Source of social media content[a,c]		
Vaping brands	43 (26.2)	17 (29.8)
Vaping retailers	32 (19.5)	11 (19.3)
Pro-vaping organizations	11 (6.7)	2 (3.5)
Health promotion organizations	54 (32.9)	13 (22.8)
The government	34 (20.7)	13 (22.8)
Influencers	109 (66.5)	41 (71.9)
Friends	94 (57.3)	30 (52.6)

Family members	16 (9.8)	8 (14.0)
Strangers	82 (50.0)	24 (42.1)
Other	10 (6.1)	3 (5.3)
Unsure	0 (0.0)	0 (0.0)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to participants who reported vaping ad exposure. [c]Question only asked to participants who reported exposure to vaping on social media. *N* = 380.

Table 6C. Advertising and Social Media by Age

Variable	Youth, *N* (%)	Young Adults, *N* (%)
Exposure to vaping ads		
Yes	37 (54.4)	117 (37.7)
No	31 (45.6)	193 (62.3)
Platform of vaping ad exposure[a,b]		
Facebook	12 (32.4)	46 (39.3)
Instagram	23 (62.2)	61 (52.1)
Snapchat	14 (37.8)	40 (34.2)
TikTok	19 (51.4)	51 (43.6)
Reddit	2 (5.4)	2 (1.7)
Twitter/X	5 (13.5)	15 (12.8)
YouTube	10 (27.0)	24 (20.5)
Other social media platform	0 (0.0)	0 (0.0)
Non-social media website	5 (13.5)	25 (21.4)
Radio	2 (5.4)	9 (7.7)
Television	4 (10.8)	15 (12.8)
Billboards	5 (13.5)	14 (12.0)
Print media	8 (21.6)	14 (12.0)
Other	0 (0.0)	4 (3.4)
Source of advertisements[a,b]		
Vaping brands	25 (67.6)	81 (69.2)
Vaping retailers	10 (27.0)	59 (50.4)
Influencers	20 (54.1)	43 (36.8)
Non-influencer selling products	17 (45.9)	23 (19.7)
Other	1 (2.7)	1 (0.9)
Unsure	1 (2.7)	13 (11.1)
Exposure to vaping content on social media		
Yes	52 (76.5)	167 (53.9)
No	16 (23.5)	143 (46.1)
Platform of vaping content exposure[a,c]		
Facebook	11 (21.2)	53 (31.7)
Instagram	34 (65.4)	113 (67.7)
Snapchat	30 (57.7)	109 (65.3)
TikTok	44 (84.6)	140 (83.8)
Reddit	5 (9.6)	23 (13.8)
Twitter/X	8 (15.4)	15 (9.0)
YouTube	19 (36.5)	65 (38.9)
Other	0 (0.0)	0 (0.0)
Source of social media content[a,c]		
Vaping brands	12 (23.1)	46 (27.5)
Vaping retailers	6 (11.5)	35 (21.0)
Pro-vaping organizations	5 (9.6)	8 (4.8)
Health promotion organizations	14 (26.9)	53 (31.7)
The government	11 (21.2)	36 (21.6)
Influencers	32 (61.5)	117 (70.1)
Friends	26 (50.0)	97 (58.1)
Family members	1 (1.9)	22 (13.2)

Strangers	23 (44.2)	1 (0.6)
Other	2 (3.8)	11 (6.6)
Unsure	0 (0.0)	0 (0.0)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to participants who reported vaping ad exposure. [c]Question only asked to participants who reported exposure to vaping on social media. *N* = 380.

Table 7. Tobacco Use

Variable	*M* (*SD*)
Cigarettes smoked per week[a]	20.97 (30.34)
Variable	***N* (%)**
Tobacco use history	
Currently use	65 (17.2)
Formerly used	263 (69.6)
Never used	50 (13.2)
Tobacco types tried[a,b]	
Cigarettes	319 (97.3)
Cigarillos	125 (38.1)
Chewing tobacco	49 (14.9)
Snuff	17 (5.2)
Snus	36 (11.0)
Other	22 (6.7)
Temporal relationship between smoking and vaping[a]	
Started smoking before vaping	105 (32.0)
Started smoking and vaping concurrently	84 (25.6)
Started smoking after vaping	139 (42.4)
Tried vaping to quit smoking[c]	
Yes	11 (50.0)
No	11 (50.0)
Used vaping to quit smoking[d]	
Yes	50 (60.2)
No	33 (39.8)
Reason for starting to smoke after vaping[b,e]	
Curiosity	73 (52.5)
Peer pressure	33 (23.7)
Lower cost	18 (12.9)
Accessibility	28 (20.1)
Reduce vaping	15 (10.8)
Other	23 (16.5)
Unsure	3 (2.2)
Reason for starting to smoke and vape concurrently[b,f]	
Curiosity	51 (60.7)
Peer pressure	29 (34.5)
Lower cost	8 (9.5)
Accessibility	24 (28.6)
Reduce vaping	8 (9.5)
Other	10 (11.9)
Unsure	8 (9.5)
Knowledge of someone who started smoking after vaping	
Yes	214 (56.5)
No	165 (43.5)
Reason this person started smoking after vaping[b,g]	
Curiosity	56 (26.2)
Peer pressure	45 (21.0)
Lower cost	57 (26.6)

Accessibility	77 (36.0)
Reduce vaping	43 (20.1)
Other	13 (6.1)
Unsure	40 (18.7)

Note. [a]Question only asked to those with a tobacco use history. [b]Participants could select more than one option. As such, percentages do not sum to 100. [c]Question only asked to those who started smoking before vaping and who were current tobacco users. [d]Question only asked to those who started smoking before vaping and who were former tobacco users. [e]Question only asked to those who started smoking after vaping. [f]Question only asked to those who started smoking and vaping concurrently. [g]Question only asked to those who knew someone that started smoking after vaping. N = 380.

Table 7A. Tobacco Use by Vaping Status

Variable	Current Vapers, *M* (*SD*)	Former Vapers, *M* (*SD*)
Cigarettes smoked per week[a]	15.98 (22.54)	35.93 (44.30)
Variable	**Current Vapers, *N* (%)**	**Former Vapers, *N* (%)**
Tobacco use history		
Currently use	50 (18.1)	15 (14.9)
Formerly used	194 (70.0)	69 (68.3)
Never used	33 (11.9)	17 (16.8)
Tobacco types tried[a,b]		
Cigarettes	240 (98.4)	79 (94.0)
Cigarillos	90 (36.9)	35 (41.7)
Chewing tobacco	31 (12.7)	18 (21.4)
Snuff	14 (5.7)	3 (3.6)
Snus	30 (12.3)	6 (7.1)
Other	16 (6.6)	6 (7.1)
Temporal relationship between smoking and vaping[a]		
Started smoking before vaping	79 (32.4)	26 (31.0)
Started smoking and vaping concurrently	51 (20.9)	33 (39.3)
Started smoking after vaping	114 (46.7)	25 (29.7)
Tried vaping to quit smoking[c]		
Yes	9 (56.2)	2 (33.3)
No	7 (43.8)	4 (66.7)
Used vaping to quit smoking[d]		
Yes	40 (63.5)	10 (50.0)
No	23 (36.5)	10 (50.0)
Reason for starting to smoke after vaping[b,e]		
Curiosity	61 (53.5)	12 (48.0)
Peer pressure	25 (21.9)	8 (32.0)
Lower cost	15 (13.2)	3 (12.0)
Accessibility	19 (16.7)	9 (36.0)
Reduce vaping	11 (9.6)	4 (16.0)
Other	18 (15.8)	5 (20.0)
Unsure	3 (2.6)	0 (0.0)
Reason for starting to smoke and vape concurrently[b,f]		
Curiosity	33 (64.7)	18 (54.5)
Peer pressure	13 (25.5)	16 (48.5)
Lower cost	4 (7.8)	4 (12.1)
Accessibility	16 (31.4)	8 (24.2)
Reduce vaping	3 (5.9)	5 (15.2)
Other	6 (11.8)	4 (12.1)
Unsure	5 (9.8)	3 (9.1)
Knowledge of someone who started smoking after vaping		
Yes	149 (53.6)	65 (64.4)
No	129 (46.4)	36 (35.6)

Reason this person started smoking after vaping[b,g]		
Curiosity	41 (27.5)	15 (23.1)
Peer pressure	29 (19.5)	16 (24.6)
Lower cost	35 (23.5)	22 (33.8)
Accessibility	51 (34.2)	26 (40.0)
Reduce vaping	26 (17.4)	17 (26.2)
Other	6 (4.0)	7 (10.8)
Unsure	30 (20.1)	10 (15.4)

Note. [a]Question only asked to those with a tobacco use history. [b]Participants could select more than one option. As such, percentages do not sum to 100. [c]Question only asked to those who started smoking before vaping and who were current tobacco users. [d]Question only asked to those who started smoking before vaping and who were former tobacco users. [e]Question only asked to those who started smoking after vaping. [f]Question only asked to those who started smoking and vaping concurrently. [g]Question only asked to those who knew someone that started smoking after vaping. N = 380.

Table 7B. Tobacco Use by Age

Variable	Youth, *M* (*SD*)	Young Adults, *M* (*SD*)
Cigarettes smoked per week[a]	19.77 (16.37)	21.33 (33.69)
Variable	**Youth, *N* (%)**	**Young Adults, *N* (%)**
Tobacco use history		
Currently use	16 (23.6)	48 (15.5)
Formerly used	46 (67.6)	217 (70.5)
Never used	6 (8.8)	43 (14.0)
Tobacco types tried[a,b]		
Cigarettes	59 (95.2)	259 (97.7)
Cigarillos	21 (33.9)	103 (38.9)
Chewing tobacco	4 (6.5)	45 (17.0)
Snuff	4 (6.5)	13 (4.9)
Snus	9 (14.5)	27 (10.2)
Other	6 (9.7)	16 (6.0)
Temporal relationship between smoking and vaping[a]		
Started smoking before vaping	12 (19.4)	93 (35.1)
Started smoking and vaping concurrently	20 (32.2)	63 (23.8)
Started smoking after vaping	30 (48.4)	109 (41.1)
Tried vaping to quit smoking[c]		
Yes	2 (40.0)	9 (52.9)
No	3 (60.0)	8 (47.1)
Used vaping to quit smoking[d]		
Yes	4 (57.1)	46 (60.5)
No	3 (42.9)	30 (39.5)
Reason for starting to smoke after vaping[b,e]		
Curiosity	12 (40.0)	61 (56.0)
Peer pressure	6 (20.0)	27 (24.8)
Lower cost	5 (16.7)	13 (11.9)
Accessibility	3 (10.0)	25 (22.9)
Reduce vaping	4 (13.3)	11 (10.1)
Other	6 (20.0)	17 (15.6)
Unsure	1 (3.3)	2 (1.8)
Reason for starting to smoke and vape concurrently[b,f]		
Curiosity	13 (65.0)	38 (60.3)
Peer pressure	8 (40.0)	21 (33.3)
Lower cost	3 (15.0)	5 (7.9)
Accessibility	4 (20.0)	20 (31.7)
Reduce vaping	2 (10.0)	6 (9.5)
Other	2 (10.0)	7 (11.1)
Unsure	3 (15.0)	5 (7.9)
Knowledge of someone who started smoking after vaping		
Yes	34 (50.0)	180 (58.3)
No	34 (50.0)	129 (41.7)
Reason this person started smoking after vaping[b,g]		
Curiosity	9 (26.5)	47 (26.1)

Peer pressure	12 (35.3)	33 (18.3)
Lower cost	8 (23.5)	49 (27.2)
Accessibility	6 (17.6)	71 (39.4)
Reduce vaping	5 (14.7)	38 (21.1)
Other	2 (5.9)	11 (6.1)
Unsure	9 (26.5)	31 (17.2)

Note. [a]Question only asked to those with a tobacco use history. [b]Participants could select more than one option. As such, percentages do not sum to 100. [c]Question only asked to those who started smoking before vaping and who were current tobacco users. [d]Question only asked to those who started smoking before vaping and who were former tobacco users. [e]Question only asked to those who started smoking after vaping. [f]Question only asked to those who started smoking and vaping concurrently. [g]Question only asked to those who knew someone that started smoking after vaping. N = 380.

Table 8. Nicotine Pouches

Variable	*N* (%)
Tried nicotine pouch	
Yes	179 (47.1)
No	201 (52.9)
Reason for trying nicotine pouch[a,b]	
Curiosity	140 (78.2)
Peer pressure	24 (13.4)
Lower cost	31 (17.3)
Accessibility	35 (19.6)
Reduce vaping	57 (31.8)
Reduce smoking	22 (12.3)
Other	14 (7.8)
Unsure	1 (0.6)
Nicotine pouch ad exposure	
Yes	209 (55.1)
No	156 (41.2)
Unsure	14 (3.7)
Source of nicotine pouch ads[a,c]	
Social media	171 (81.8)
Television	19 (9.1)
Radio	1 (0.5)
Print media	13 (6.2)
Billboard	23 (11.0)
Inside a store	110 (52.6)
Other	0 (0.0)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to those who reported trying nicotine pouches. [c]Question only asked to participants who reported nicotine pouch ad exposure. *N* = 380.

Table 8A. Nicotine Pouches by Vaping Status

Variable	Current Vapers, *N* (%)	Former Vapers, *N* (%)
Tried nicotine pouch		
Yes	133 (47.7)	46 (45.5)
No	146 (52.3)	55 (54.5)
Reason for trying nicotine pouch[a,b]		
Curiosity	109 (82.0)	31 (67.4)
Peer pressure	16 (12.0)	8 (17.4)
Lower cost	24 (18.0)	7 (15.2)
Accessibility	27 (20.3)	8 (17.4)
Reduce vaping	45 (33.8)	12 (26.1)
Reduce smoking	20 (15.0)	2 (4.3)
Other	8 (6.0)	6 (13.0)
Unsure	1 (0.8)	0 (0.0)
Nicotine pouch ad exposure		
Yes	157 (56.2)	52 (52.0)
No	114 (40.9)	42 (42.0)
Unsure	8 (2.9)	6 (6.0)
Source of nicotine pouch ads[a,c]		
Social media	128 (81.5)	43 (82.7)
Television	17 (10.8)	2 (3.8)
Radio	1 (0.6)	0 (0.0)
Print media	12 (7.6)	1 (1.9)
Billboard	17 (10.8)	6 (11.5)
Inside a store	83 (52.9)	27 (51.9)
Other	0 (0.0)	0 (0.0)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to those who reported trying nicotine pouches. [c]Question only asked to participants who reported nicotine pouch ad exposure. *N* = 380.

Table 8B. Nicotine Pouches by Age

Variable	Youth, *N* (%)	Young Adults, *N* (%)
Tried nicotine pouch		
Yes	37 (54.4)	142 (45.8)
No	31 (45.6)	168 (54.2)
Reason for trying nicotine pouch[a,b]		
Curiosity	29 (78.4)	111 (78.2)
Peer pressure	8 (21.6)	16 (11.3)
Lower cost	4 (10.8)	27 (19.0)
Accessibility	4 (10.8)	31 (21.8)
Reduce vaping	10 (27.0)	47 (33.1)
Reduce smoking	2 (5.4)	20 (14.1)
Other	3 (8.1)	11 (7.7)
Unsure	0 (0.0)	1 (0.7)
Nicotine pouch ad exposure		
Yes	40 (58.8)	168 (54.4)
No	26 (38.3)	129 (41.7)
Unsure	2 (2.9)	12 (3.9)
Source of nicotine pouch ads[a,c]		
Social media	36 (90.0)	134 (79.8)
Television	4 (10.0)	15 (8.9)
Radio	0 (0.0)	1 (0.6)
Print media	1 (2.5)	12 (7.1)
Billboard	5 (12.5)	18 (10.7)
Inside a store	20 (50.0)	90 (53.6)
Other	0 (0.0)	0 (0.0)

Note. [a]Participants could select more than one option. As such, percentages do not sum to 100. [b]Question only asked to those who reported trying nicotine pouches. [c]Question only asked to participants who reported nicotine pouch ad exposure. *N* = 380.

Table 9. Impact of Vaping Legislation on Vaping Behaviour

Variable	*N* (%)
Banning flavours	
Did not affect my vaping	288 (76.0)
Made me vape less	40 (10.5)
Made me vape more	34 (9.0)
Unsure	17 (4.5)
Nicotine concentration cap	
Did not affect my vaping	270 (71.2)
Made me vape less	27 (7.1)
Made me vape more	67 (17.7)
Unsure	15 (4.0)
Price increases	
Did not affect my vaping	264 (69.7)
Made me vape less	80 (21.1)
Made me vape more	14 (3.7)
Unsure	21 (5.5)
Advertisement bans	
Did not affect my vaping	338 (89.2)
Made me vape less	11 (2.9)
Made me vape more	8 (2.1)
Unsure	22 (5.8)

Note. *N* = 380.

Table 9A. Impact of Vaping Legislation on Vaping Behaviour by Vaping Status

Variable	Current Vapers, *N* (%)	Former Vapers, *N* (%)
Banning flavours		
Did not affect my vaping	213 (76.6)	75 (74.2)
Made me vape less	22 (7.9)	18 (17.8)
Made me vape more	29 (10.5)	5 (5.0)
Unsure	14 (5.0)	3 (3.0)
Nicotine concentration cap		
Did not affect my vaping	203 (73.0)	67 (66.3)
Made me vape less	15 (5.4)	12 (11.9)
Made me vape more	48 (17.3)	19 (18.8)
Unsure	2 (4.3)	3 (3.0)
Price increases		
Did not affect my vaping	200 (72.0)	64 (63.3)
Made me vape less	46 (16.5)	34 (33.7)
Made me vape more	13 (4.7)	1 (1.0)
Unsure	19 (6.8)	2 (2.0)
Advertisement bans		
Did not affect my vaping	250 (89.9)	88 (87.1)
Made me vape less	4 (1.4)	7 (6.9)
Made me vape more	8 (2.9)	0 (0.0)
Unsure	16 (5.8)	6 (5.9)

Note. *N* = 380.

Table 9B. Impact of Vaping Legislation on Vaping Behaviour by Age

Variable	Youth, *N* (%)	Young Adults, *N* (%)
Banning flavours		
Did not affect my vaping	52 (77.5)	234 (75.5)
Made me vape less	5 (7.5)	35 (11.3)
Made me vape more	6 (9.0)	28 (9.0)
Unsure	4 (6.0)	13 (4.2)
Nicotine concentration cap		
Did not affect my vaping	47 (70.1)	221 (71.3)
Made me vape less	6 (9.0)	21 (6.8)
Made me vape more	10 (14.9)	57 (18.4)
Unsure	4 (6.0)	11 (3.5)
Price increases		
Did not affect my vaping	50 (74.6)	214 (69.0)
Made me vape less	12 (17.9)	67 (21.6)
Made me vape more	2 (3.0)	12 (3.9)
Unsure	3 (4.5)	17 (5.5)
Advertisement bans		
Did not affect my vaping	62 (92.5)	274 (88.4)
Made me vape less	2 (3.0)	9 (2.9)
Made me vape more	1 (1.5)	7 (2.3)
Unsure	2 (3.0)	20 (6.4)

Note. *N* = 380.